Vol. 923 Number 4

# OFFICIAL GAZETTE

of the
UNITED STATES PATENT OFFICE

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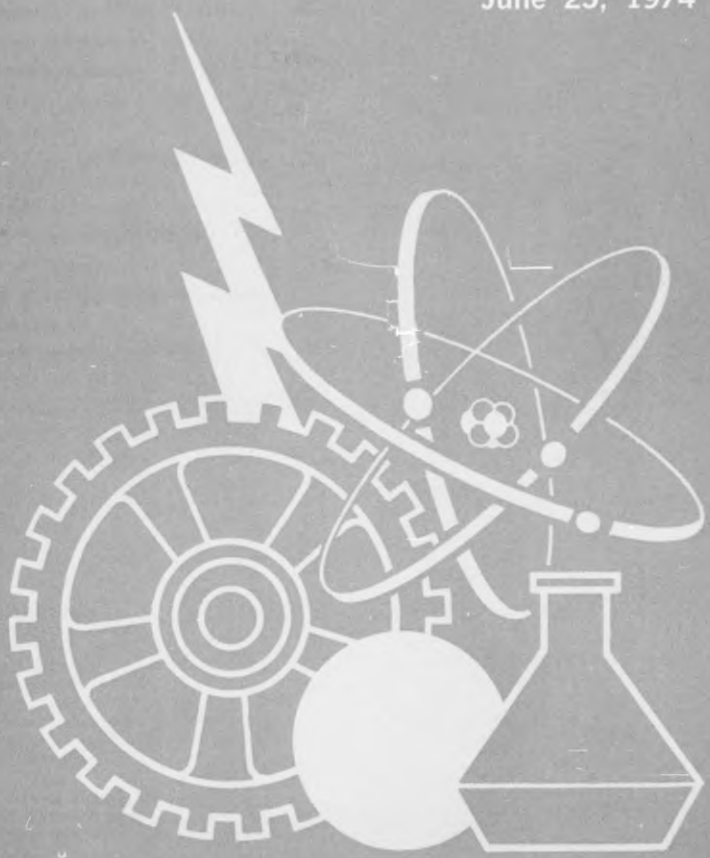
PATENTS

June 25, 1974



U. S. DEPARTMENT OF COMMERCE
Patent Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

June 25, 1974 Volume 923 Number 4

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# PATENT OFFICE NOTICES

## Trademark Manual of Examining Procedure Now Available

The Trademark Manual of Examining Procedure (designated in brief as TMEP) may be ordered on a subscription basis from the Superintendent of Documents at the following address:

Superintendent of Documents
U.S. Government Printing Office
Washington, D.C. 20402

The price of a subscription is $8.10, plus $2.05 for foreign mailing. Payment should accompany the order. (Orders should *not* be placed with the Patent Office.)

The purpose of the Trademark Manual of Examining Procedure is to provide an authoritative reference work on practices and procedures relative to prosecution of applications to register marks in the Patent Office. Revisions necessary to keep the Manual current will be made by issuance of sets of revision pages from time to time as part of the Manual subscription. Early information as to changes in the Manual will be given prior to issuance of revision pages by notices in the OFFICIAL GAZETTE or by change notices furnished to Manual subscribers.

The Trademark Directives which were issued as Series 1 (pre-Manual) pending publication of the Manual, have been incorporated in the Manual, and there will be no further Directives in that Series. (For announcements as to the pre-Manual Directives, see OFFICIAL GAZETTES of August 31, 1971, Vol. 889, No. 5, and April 4, 1972, Vol. 897, No. 1.)

RENE D. TEGTMEYER,
May 29, 1974. *Assistant Commissioner for Trademarks.*

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## Abandoned Applications Referred to in Defensive Publications

[37 CFR Part 1]

*Public Inspection*

Notice is hereby given that, pursuant to authority contained in section 6 of the Act of July 19, 1952 (66 Stat. 793 (35 U.S.C. 6), as amended October 5, 1971, Pub. L. 92–132, 85 Stat. 364, the Patent Office proposes to amend Title 37 of the Code of Federal Regulations by revising § 1.14(b).

All persons are invited to present in writing their views, objections, recommendations or suggestions in connection with the proposed amendment to the Commissioner of Patents, Washington, D.C. 20231 no later than June 30, 1974. Submissions made pursuant to this notice may be inspected by any person, upon written request, a reasonable time after the closing date for submitting comments.

The proposed amendment would open to public inspection those abandoned patent applications which are referred to in Defensive Publication applications opened to public inspection pursuant to §§ 1.11(b) and 1.139. The purpose of the proposal is to encourage greater use of the Defensive Publication Program provided under § 1.139.

The objective of the Defensive Publication Program is "to provide better service to the public by making available the technical disclosure of certain applications in which the owner may prefer to publish an abstract in lieu of obtaining an examination by the Patent Office" (notice published on April 11, 1968, in 33 FR 5623, and in 849 O.G. 1221 on April 30, 1968). To accomplish that objective, §§ 1.11(b) and 1.139 open the complete Defensive Publication application to inspection by the general public upon publication of the abstract. The proposed amendment would have the effect of placing a Defensive Publication application on the same footing as an issued patent, insofar as making technical disclosures available to the public is concerned, by opening to public inspection an abandoned patent application referred to in the Defensive Publication application as well as in an issued patent. Applicants would benefit from the assurance that the disclosure of an abandoned application, which is referred to in a Defensive Publication application, would be open to public inspection and need not be repeated in the Defensive Publication application.

The text of the proposed revised rule is as follows:

§ 1.14 *Patent applications preserved in secrecy.*

* * * * * *

(b) Except as provided in § 1.11(b) abandoned applications are likewise not open to public inspection, except that if an application referred to in a U.S. patent, or in an application which is open to inspection pursuant to § 1.139, is abandoned and is available, it may be inspected or copies obtained by any person on written request, without notice to the applicant. Abandoned applications may be destroyed after 20 years from their filing date, except those to which particular attention has been called and which have been marked for preservation. Abandoned applications will not be returned.

* * * * * *

Dated: May 20, 1974.

C. MARSHALL DANN,
*Commissioner of Patents.*

Approved: May 28, 1974.

BETSY ANCKER-JOHNSON,
*Assistant Secretary for Science and Technology.*

[FR Doc. 74–12726; Filed 6–3–74; 8:45 am]

*Published in 39 F.R. 19786*

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## Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

**2,628,568,** M. L. Rhine, HIGH PRESSURE PUMP, **filed** Aug. 30, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c2167, *TRW, Inc. (formerly Thompson Ramo Wooldridge Inc.)* v. *Ellipse Corporation and Ford Motor Company.* Cause is dismissed, Mar. 12, 1973.

**2,674,229,** N. T. Karlen, SPEED LIMITING GOVERNOR FOR FLUID DRIVEN ROTARY DEVICES; **2,925,089,** Conklin, Rockwood, Smelker and Linsker, PNEUMATIC TOOL, **filed** Aug. 17, 1970, D.C., N.D. Ill. (Chicago), Doc. 70c2027, *Rockwell Manufacturing Company* v. *Chicago Pneumatic Tool Company.* Pursuant to Rule 41(a) and (c) plaintiff dismisses with prejudice, case dismissed, Nov. 20, 1973.

**2,781,005,** Taylor, MacFarlane and Stephenson, METHOD OF REDUCING VANADIUM CORROSION IN GAS TURBINES, **filed** Jan. 15, 1968, D.C., M.D. Fla. (Jacksonville), Doc. 68–23–C–J, *Basic Incorporated* v. *The City of Jacksonville, Florida.* Consent judgment and action dismissed with prejudice, Oct. 12, 1973.

**2,822,682,** L. D. Sollenberger, WEATHER-TIGHT ENCLOSURE; **3,056,544,** Sollenberger and Sciacero, PARKING METER LOCKING MEANS, **filed** Nov. 26, 1973, D.C.N.J. (Newark), Doc. 1688–73, *American Parking Meter Company* v. *Duncan Industries.* **Same, filed** Dec. 12, 1973, D.C.N.J. (Newark), Doc. 1789–73, *Qonaar Corporation* v. *Time Mechanisms, Inc.*

**2,841,394,** A. R. Stobb, COLLECTOR FOR FLEXIBLE SHEETS; **2,933,313,** same, METHOD AND MEANS FOR COLLECTING FLEXIBLE SHEETS; **3,188,082,** W. E. K. Kerris, ELECTRICAL PRIMARY FLIGHT CONTROL SYSTEM UTILIZING REDUNDANT CHANNELS, **filed** Dec. 24, 1970, D.C., N.D. Ill. (Chicago), Doc. 70c3227, *Stobbs, Inc. and Western Printing & Lithographing Co.* v. *Newton Christmas and Industrial Design & Engineering, Inc.* Dismissed by stipulation, Sept. 24, 1973.

**2,919,200,** Dubin and White, BACTERIOSTATIC PLASTIC. **filed** Apr. 13, 1973, D.C., E.D. Mo. (St. Louis), Doc. 73C221 (3), *Maurice T. Dubin and James S. White* v. *United States Gypsum Co. and Central Hardware.* Consent judgment—patent valid and defendant has infringed; case dismissed, Nov. 16, 1973.

**2,925,089.** (See 2,674,229.)

**2,933,313.** (See 2,841,394.)

**3,055,705,** K. H. Wilson, FOLDING TABLE AND SEAT STRUCTURE, **filed** Jan. 22, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c190, *Kermit H. Wilson and Sico Inc.* v. *Midwest Folding Products Mfg. Co. and Midwest Folding Products Sales Corp.* Enter memorandum of decision, findings of fact and conclusions of law; case dismissed, Oct. 10, 1972.

**3,056,544.** (See 2,822,682.)

**3,103,666,** A. R. Bone, TAG ATTACHING APPARATUS, **filed** Apr. 30, 1973, D.C., E.D. Mo. (St. Louis), Doc. 73C264 (1), *Dennison Manufacturing Company* v. *Consolidated Foods Corp., doing business as Garvey Corp.* Consent judgment, patent is valid and plaintiff is granted a permanent injunction against defendant, Dec. 3, 1973.

**3,178,159,** W. C. Johnson, METHOD OF AND APPARATUS FOR HUMIDIFYING AIR, **filed** July 10, 1970, D.C., N.D. Ill. (Chicago), Doc. 70c1698, *Hamilton Humidity, Inc.* v. *International Business Machines Corp.* Enter order, agreed order of dismissal, Feb. 9, 1971.

**3,183,529,** G. Beuchat, SWIMMER'S FOOT-FIN WITH THRUST-ACCELERATING DEVICE, **filed** June 5, 1973, D.C., C.D. Calif. (Los Angeles), Doc. 73–1261–LTL, *U.S. Divers Company* v. *Under Sea Industries.* Filed Plaintiff's notice of dismissal with prejudice entered Dec. 5, 1973.

**3,188,082.** (See 2,841,394.)

**3,201,855,** B. F. Hay, ELECTRICAL RESISTOR AND METHOD OF MAKING SAME; **3,206,704,** same, ELECTRICAL RESISTOR; **3,295,090,** same, ELECTRICAL RESISTOR HAVING A CORE ELEMENT WITH HIGH HEAT DISSIPATING PROPERTIES; **D. 201,884,** S. Braun, DISPLAY BOX, **filed** June 13, 1973, Court of Appeals, Mass. (Boston), Doc. 73–1203, *Dale Electronics, Inc.* v. *R.C.L. Electronics, Inc.* Judgment entered affirming certain parts of the judgments and orders of the district court and vacating portion of judgments and remanding for further proceedings, Dec. 5, 1973.

**3,206,704.** (See 3,201,855.)

**3,217,375,** C. H. Kinnard, APPARATUS FOR FORMING CONCRETE PLANKS OR SLABS HAVING ACOUSTICAL PROPERTIES; **3,523,343,** W. E. Mitchell, SYSTEM FOR THE PRODUCTION OF CAST CONCRETE MEMBERS; **Reg. No. 757,583** (SPANDECK), Franklin Concrete, Inc.; **Reg. No. 834,680** (SPAN-DECK), Span-Deck, Inc., **filed** Nov. 1, 1973, D.C. Minn. (Minneapolis), Doc. 4–73 C–535, *Span-Deck, Inc.* v. *Fab-Con Incorporated and Rauenhorst Corporation.*

**3,275,316,** G. V. Cleary, INSERT FOR NEWSPAPER, **filed** Jan. 7, 1971, D.C., N.D. Ill. (Chicago), Doc. 72c58, *Free Standing Stuffer, Inc.* v. *Time Inc.* Stipulation, cause dismissed with prejudice, June 12, 1972.

**3,295,090.** (See 3,201,855.)

**3,321,656,** E. E. Sheldon, TELEVISION CAMERA TUBE WITH LEAD OXIDE SCREEN, **filed** Mar. 6, 1969, D.C., N.D. Ill. (Chicago), Doc. 69c488, *Edward Emanual Sheldon* v. *Amperex Electronic Corporation et al.* Entry of order and judgment upon joint consent dismissed, Feb. 26, 1973.

**3,339,366,** Gogan and Joly, STRUCTURE FOR LEACHING FIELDS, **filed** July 2, 1973, Court of Appeals, Mass. (Boston), Doc. 73–1229, *American Precast Corporation* v. *Maurice Concrete Products, Inc.* The judgment of the District Court is affirmed, Dec. 3, 1973.

**3,342,151,** R. B. Howell, UNIVERSAL PRESSER FOOT ATTACHMENT; **3,349,736,** same, ZIPPER FOOT ATTACHMENTS; **3,473,498,** same, **filed** Mar. 13, 1972, D.C., N.D. Ill. (Chicago), Doc. 72c648, *Robert B. Howell, Unique Zipper Distributing Co., Div. American Can Co.* v. *Donahue Sales, Textron, Inc. and Pirie Scott Co.* Suit dismissed with prejudice with right to be reinstated with notice to the Court by either party, Nov. 26, 1973.

**3,349,736.** (See 3,342,151.)

**3,394,916,** E. L. Birr, BALL VALVE AND METHOD OF MAKING SAME, **filed** July 10, 1970, D.C., N.D. Ill. (Chicago), Doc. 70c1687, *Hills McCanna Co. etc.* v. *Cabot Corp., etc.* On stipulation pursuant to provisions of Rule 41(1)(u), cause dismissed without prejudice, Mar. 28, 1972.

**3,473,110,** Hardin and Lovrenich, ELECTRONIC CONDUCTOR DETECTOR AND INDICATOR, **filed** Jan. 27, 1970, D.C., N.D. Ill. (Chicago), Doc. 70c188, *Eltra Corporation* v. *Electro Products Laboratories, Inc.* Enter order dismissing cause without prejudice, Dec. 10, 1970.

**3,473,498.** (See 3,342,151.)

**3,485,018,** Beckering, Duran and Lessig, LAWN MOWER DECK HOUSING, **filed** June 14, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c1427, *Black & Decker Mfg. Co.* v. *Sunbeam Corporation.* Cause dismissed with prejudice, Nov. 27, 1972.

**3,499,239,** A. J. Mungo, FIREPLACE FLAME SIMULATING DEVICE; **3,526,984,** Nielsen and Vailliant, LIGHTED FIREPLACE AND FIRE NOISE SIMULATOR, **filed** Dec. 6,1973, D.C.N.J. (Newark), Doc. C–1754–73, *Drum Fire, Inc.* v. *Rustic Crafts Co., Inc.*

**3,502,933,** Leimontas and Paradise, KINESCOPE SOCKET WITH SPARK GAP; **3,533,727,** Grunwald and Innes, POLYPROPYLENE DYEING WITH A TURPENTINE EMULSION AND SOLVENT SOLUBLE DYE, **filed** Mar. 30, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c788, *Connector Corp.* v. *Permonite Mfg. Co.* Enter judgment order in favor of defendant and against plaintiff, complaint dismissed with prejudice, May 30, 1972.

**3,517,254,** A. C. McNamara Jr., CONTINUOUS LIGHTING SYSTEM FOR GASEOUS-DISCHARGE LAMPS WITH INCANDESCENT LIGHTS FOR STANDBY, **filed** Dec. 29, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c3128, *Esquire, Inc.* v. *Thomas Ind. Inc. and Litton Ind. Inc.* Enter consent judgment re validity of patent, infringement of circuit #1 and non-infringement of circuit #2, June 30, 1972.

**3,523,343.** (See 3,217,375.)

**3,526,984.** (See 3,499,239.)

**3,659,627,** Zimmerer, Zimmerer and Zimmerer, COLLECTOR RING FOR IRRIGATION PIPE SYSTEMS, **filed** Nov. 19, 1973, D.C., E.D. Wash. (Spokane), Doc. 4008, *Lindsay Mfg. Co.* v. *Pringle Mfg. Co.*

**3,736,035,** Brown and Bilek, MODULAR DISPLAY ASSEMBLY, **filed** Nov. 26, 1973, D.C. Pa. (Philadelphia), Doc. CA 73–2662, *DCA Educational Products, Inc.* v. *United States Steel Corporation.*

**D. 201,884.** (See 3,201,855.)

**Reg. No. 757,583.** (See 3,523,343.)

**Reg. No. 834,680.** (See 3,217,375.)

## Disclaimers

3,322,127.—*Charles M. Sachs*, Fort Lee, N.J. ANTI-CREEP BRASSIERE. Patent dated May 30, 1967. Disclaimer filed May 6, 1974, by the assignee, *Rapid-American Corporation.*

Hereby disclaims the portion of the term of the patent subsequent to May 31, 1980.

3,381,689.—*Charles M. Sachs*, West Englewood, N.J. BRASSIERE. Patent dated May 7, 1968. Disclaimer filed May 6, 1974, by the assignee, *Rapid-American Corporation.*

Hereby disclaims the portion of the term of the patent subsequent to May 31, 1980.

3,478,747.—*Charles M. Sachs*, Teaneck, N.J. BRASSIERE. Patent dated Nov. 18, 1969. Disclaimer filed May 6, 1974, by the assignee, *Rapid-American Corporation.*

Hereby disclaims the portion of the term of the patent subsequent to May 31, 1980.

3,671,077.—*Charles T. Hoyt, John W. Haun*, and *Dwight L. Hensel*, Brillion, Wis., *Clarence M. Hansen*, East Lansing, Mich., *Walter G. Lovely*, Ames, Iowa, and *Hjalmar D. Bruhn*, Madison, Wis. FORAGE BLOWER. Patent dated June 20, 1972. Disclaimer filed May 6, 1974, by the assignee, *Sperry Rand Corporation.*

Hereby enters this disclaimer to claims 1–4 of said patent.

3,711,604.—*Daniel Colodney*, Green Brook, and *Martin Cordon*, Highland Park, N.J. FLUORIDE CONTAINING TRANSPARENT DENTIFRICE. Patent dated Jan. 16, 1973. Disclaimer filed Feb. 22, 1974, by the assignee, *Colgate-Palmolive Company.*

Hereby enters this disclaimer to claim 21 of said patent.

3,784,238.—*Glenn G. Change* and *Sam T. Crews*, Houston, and *Clenis E. Wilson*, Spring, Tex. INTERMEDIATE DRILL STEM. Patent dated Jan. 8, 1974. Disclaimer filed Nov. 30, 1973, by the assignee, *Smith International, Inc.*

Hereby disclaims the portion of the term of the patent subsequent to Nov. 20, 1990.

## Disclaimer and Dedication

3,630,216.—*Warner M. Kelly*, Houston, Tex. CONDITION-SENSING SAFETY VALVE DEVICES. Patent dated Dec. 28, 1971. Disclaimer and Dedication filed Apr. 11, 1974, by the assignee, *Otis Engineering Corporation.*

Hereby disclaims and dedicates to the Public the remaining term of said patent.

## Certificates of Correction for the Week of June 25, 1974

| | | | |
|---|---|---|---|
| Re. 27,789 | 3,755,958 | 3,768,680 | 3,777,266 |
| 3,476,801 | 3,756,075 | 3,768,701 | 3,778,128 |
| 3,578,548 | 3,756,138 | 3,769,083 | 3,778,601 |
| 3,597,146 | 3,756,229 | 3,769,455 | 3,778,722 |
| 3,651,098 | 3,756,355 | 3,769,587 | 3,779,217 |
| 3,657,849 | 3,757,040 | 3,769,589 | 3,780,010 |
| 3,677,983 | 3,757,557 | 3,769,889 | 3,780,780 |
| 3,679,120 | 3,757,645 | 3,769,966 | 3,780,855 |
| 3,696,193 | 3,757,966 | 3,770,113 | 3,781,642 |
| 3,700,526 | 3,758,587 | 3,770,751 | 3,781,708 |
| 3,705,140 | 3,758,766 | 3,771,272 | 3,781,812 |
| 3,706,870 | 3,759,651 | 3,771,622 | 3,783,013 |
| 3,711,745 | 3,760,068 | 3,771,646 | 3,784,188 |
| 3,718,728 | 3,760,099 | 3,771,710 | 3,785,288 |
| 3,721,661 | 3,760,283 | 3,771,944 | 3,785,289 |
| 3,725,381 | 3,760,865 | 3,773,066 | 3,785,360 |
| 3,729,342 | 3,761,414 | 3,773,171 | 3,785,411 |
| 3,732,139 | 3,761,807 | 3,773,743 | 3,785,691 |
| 3,736,330 | 3,762,686 | 3,773,975 | 3,786,471 |
| 3,741,949 | 3,763,145 | 3,774,217 | 3,787,229 |
| 3,744,713 | 3,763,659 | 3,775,019 | 3,787,424 |
| 3,747,109 | 3,764,518 | 3,775,410 | 3,788,077 |
| 3,747,335 | 3,764,750 | 3,775,738 | 3,790,062 |
| 3,750,902 | 3,765,237 | 3,776,073 | 3,790,478 |
| 3,751,797 | 3,766,524 | 3,776,316 | 3,790,506 |
| 3,752,021 | 3,767,041 | 3,776,369 | 3,791,449 |
| 3,752,827 | 3,767,078 | 3,776,428 | 3,792,795 |
| 3,752,966 | 3,767,790 | 3,776,724 | 3,793,597 |
| 3,754,001 | 3,767,853 | 3,777,023 | 3,800,658 |
| 3,754,426 | 3,768,133 | 3,777,028 | |
| 3,755,339 | 3,768,563 | 3,777,058 | |
| 3,755,610 | 3,768,670 | 3,777,153 | |

# PATENT EXAMINING CORPS

## WILLIAM FELDMAN, Acting Assistant Commissioner

## CONDITION OF PATENT APPLICATIONS AS OF JUNE 8, 1974

| PATENT EXAMINING GROUPS | Actual Filing Date of Oldest New Case Awaiting Action |
|---|---|
| **CHEMICAL EXAMINING GROUPS** | |
| GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds: Inorganic Compositions: Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices. | 7-2-73 |
| GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids, Carboxylic Acid Esters; Acid Anhydrides; Acid Halides. | 3-26-73 |
| HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes. | 7-3-73 |
| COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. L. LEAVITT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography. | 6-15-73 |
| SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. FRIEDMAN, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes. | 4-6-73 |
| **ELECTRICAL EXAMINING GROUPS** | |
| INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales. | 11-1-73 |
| SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material. | 1-19-73 |
| INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts. | 7-9-73 |
| RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—L. FORMAN, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating. | 2-14-73 |
| ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring. | 5-9-73 |
| DESIGNS, GROUP 290—C D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts. | 9-29-72 |
| **MECHANICAL EXAMINING GROUPS** | |
| HANDLING AND TRANSPORTING MEDIA, GROUP 310—G. M. FORLENZA, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment. | 9-14-73 |
| MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks. | 7-10-73 |
| AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. PULFREY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination. | 5-21-73 |
| HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication. | 9-7-73 |
| GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures: Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines. | 6-13-73 |

**Expiration of patents:** The patents within the range of numbers indicated below expire during June 1974, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253 Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

**Patents**..... Numbers 2,794,186 to 2,797,413, inclusive
**Plant Patents**..... Numbers 1,606 to 1,611, inclusive

# REISSUES

## JUNE 25, 1974

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

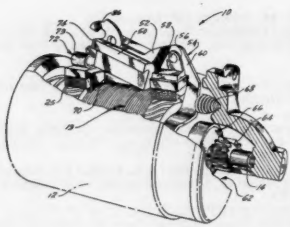
### 28,052
### COIL SET FOR AUTOMOBILE STARTER MOTORS

Henry P. Erwin, Jr., 617 Arbor St., Pasadena, Calif. 91105

Original No. 3,733,494, dated May 15, 1973, Ser. No. 253,396, May 15, 1972, which is a continuation-in-part of application Ser. No. 127,928, Mar. 28, 1971. Application for reissue Aug. 9, 1973, Ser. No. 387,156

Int. Cl. F02n *11/00*

U.S. Cl. 290—38 4 Claims



An improved [replacement] field coil set is provided for automobile starter motors of the movable pole type having four field coils of which one coil serves as a pull-in and hold-in coil for the movable pole-piece in addition to serving as a field coil for inducing rotation of the motor armature. In the improved coil set, the one coil is comprised of a single winding formed by a single conductor of predetermined turns and dimensions so selected that the one coil operates to pull the movable pole-piece into the center of the coil during initial current flow only through the single winding and also during current flow through all coils to hold the movable pole-piece in its pulled-in position without chatter of the movable pole-piece during no-load operating conditions of the motor. The four coils of the improved coil set are interconnected in a two-and-two series-parallel relation to each other so that, upon installation of the coil set in a starter motor, the conductors interconnecting the coils of the set are all disposed at a common end of the motor.

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### 28,053
### MATERIAL SECURING AND TRANSPORTING APPARATUS

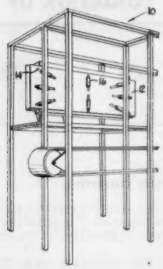
James Burr Hodsman, Danville, Quebec, Canada, assignor to Canadian Johns-Manville Co., Ltd., Asbestos, Quebec, Canada

Original No. 3,688,421, dated Sept. 5, 1972, Ser. No. 108,883, Jan. 22, 1971. Application for reissue Aug. 10, 1973, Ser. No. 387,415

Int. Cl. B66b *17/00;* D06c *3/08*

U.S. Cl. 38—102.1 10 Claims

A material securing and transporting apparatus for handling porous or non-porous materials. The device is provided with a main support having a plurality of material securing implements slidably mounted thereon for contact with a wrinkled material. Upon impinging the material each implement can be outwardly displaced from



an interior portion of the support to effectively eliminate undesirable wrinkles within the material.

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### 28,054
### PHOTOGRAPHIC APPARATUS AND METHOD

Albert J. Bachelder, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Original No. 3,647,441, dated Mar. 7, 1972, Ser. No. 804,819, Mar. 6, 1969, which is a continuation-in-part of application Ser. No. 744,912, July 15, 1968, now Patent No. 3,652,281. Application for reissue Feb. 21, 1973, Ser. No. 334,218

Int. Cl. G03c *5/54*

U.S. Cl. 96—29 R 13 Claims

A self-developing camera for use with a photographic film unit including a photosensitive sheet and a second sheet secured in face-to-face relation by external binding strips secured to the lateral margins of the sheets and adapted to be processed to produce a visible image by a liquid processing agent distributed between the sheets in a uniform thin layer at least coextensive with the exposed area of the photosensitive sheet. The camera includes a pair of juxtaposed pressure-applying rolls for distributing the processing liquid between the sheets, and one of the rolls includes annular grooves near its ends for receiving lateral edge portions of the binding strips during movement of the film unit between the rolls to relieve the pressure on the edge portions of the binding strips while the medial sections of the rolls engage the sheets and are spaced apart by engagement of the end sections of the rolls with the binding strips at the lateral edges of the film unit.

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### 28,055
### ACETOACETAMIDE COUPLERS IN WHICH THE NON-OXO CARBON ATOM OF THE ACETO GROUP IS A TERTIARY CARBON ATOM

Arnold Weissberger, Rochester, N.Y., and Charles J. Kibler, Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Original No. 3,384,657, dated May 21, 1968, Ser. No. 516,802, Sept. 28, 1965, which is a division of application Ser. No. 364,450, May 4, 1964, now Patent No. 3,265,506, which is a continuation-in-part of abandoned application Ser. No. 25,295, Apr. 28, 1960. Application for reissue Aug. 9, 1972, Ser. No. 165,794

Int. Cl. C07c *143/52*

U.S. Cl. 260—507 R 9 Claims

Acetoacetamide couplers in which the non-oxo carbon atom of the aceto group is a tertiary carbon atom are

advantageously used as yellow dye-forming couplers in photography; the couplers are characterized by producing dyes upon color development that have very desirable absorption characteristics with relatively low absorption in the green and red areas of the spectrum, exceptionally good stability to prolonged exposure to light and the couplers when incorporated in photographic emulsion layers exhibit considerably less "print out" on prolonged exposure to light and less "yellowing" than prior art couplers such as the alpha-benzoyl analogues.

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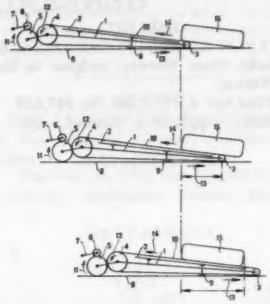
**28,056**
**STRETCHER**
**Simon Stevens, Emmen, Netherlands, by Stero N.V., Emmen, Netherlands, assignee**
**Original No. 3,654,644, dated Apr. 11, 1972, Ser. No. 869,579, Oct. 27, 1969. Application for reissue Nov. 15, 1972, Ser. No. 306,745**
**Claims priority, application Netherlands, Feb. 7, 1969, 6903052**
**Int. Cl. A61g** *7/10;* **B66f** *11/00*
**U.S. Cl. 5—81** **4 Claims**

A stretcher having an endless belt of flexible material guided by two spaced-apart parallel guides on a frame. A supporting plate is affixed to the frame under the flexible belt. Mounted on the frame is a propulsion mechanism coupled to a driving mechanism for driving the belt in a circumferential direction in such a way that, on moving the frame in the longitudinal direction of the belt with



respect to the ground, a corresponding displacement of the belt in the opposite direction is effected.

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# PLANT PATENTS

## GRANTED JUNE 25, 1974

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

**3,576**
**CHRYSANTHEMUM PLANT**
**Walter H. Jessel, Jr., Doylestown, and William E. Duffett, Akron, Ohio, assignors to Yoder Brothers, Inc., Barberton, Ohio**
**Filed Jan. 31, 1973, Ser. No. 328,416**
**Int. Cl. A01h** *5/00*
**U.S. Cl. Plt.—74** **1 Claim**

1. A new and distinct cultivar of chrysanthemum characterized particularly as to its uniqueness when compared to the unpatented cultivar Bonnie Jean by its ivory white flower color; approximately 4"–5" less vigor and 2" more spread when grown as a spray pot; approximately 4–5 days earlier response and 4–5 days shorter crop time; smaller and finer textured foliage; year round recommended period of use; by its absence of pollen resulting in an improved keeping quality and homelife of 4–5 days, as well as ray petals that are not marred with pollen; greater uniformity of flowering response, even when buds are initiated under low temperature; by its lack of sensitivity to present day greenhouse chemicals; improved flower substance, and improved form retention in low light periods.

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**3,577**
**AZALEA PLANT**
**Takeo Yuge, Altadena, Calif., assignor to Geo. J. Ball, Inc., West Chicago, Ill.**
**Filed Jan. 15, 1973, Ser. No. 323,916**
**Int. Cl. A01h** *5/00*
**U.S. Cl. Plt.—55** **1 Claim**

A new variety of azalea plant adapted for pot-forcing and characterized by its profuse and early spring production of large red and white variegated flowers, the red coloring of the petals extending outwardly from the petal base and being incised into a pure white petal margin.

**3,578**
**APPLE TREE**
**Fred J. Campbell, Othello, Wash., assignor to Hilltop Orchards & Nurseries, Inc.**
**Filed Aug. 24, 1972, Ser. No. 283,500**
**Int. Cl. A01h** *5/03*
**U.S. Cl. Plt.—35** **1 Claim**

1. A new and distinct variety of apple tree substantially as shown and described.

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**3,579**
**ROSE PLANT**
**William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.**
**Filed Jan. 8, 1973, Ser. No. 321,815**
**Int. Cl. A01h** *5/00*
**U.S. Cl. Plt.—21** **1 Claim**

1. A new and distinct variety of rose plant of a class between hybrid tea and floribunda, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of Cardinal Red flowers borne in clusters on an upright plant of hybrid tea size; very high resistance to rose powdery mildew; and its dark green, semi-glossy foliage.

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**3,580**
**AZALEA PLANT**
**Takeo Yuge, Altadena, Calif., assignor to Geo. J. Ball, Inc., West Chicago, Ill.**
**Filed Jan. 15, 1973, Ser. No. 323,917**
**Int. Cl. A01h** *5/00*
**U.S. Cl. Plt.—55** **1 Claim**

A new variety of azalea plant for potted plant culture characterized by its early spring flowering habit and its profuse production of large pink blossoms on a compact and profusely branched plant form.

# PATENTS

GRANTED JUNE 25, 1974

## GENERAL AND MECHANICAL

### 3,818,507
### PROTECTIVE SUIT AGAINST POISONOUS SUBSTANCES

Gunnar Albrecht, Moss, Norway, assignor to Helly-Hansen A/S, Moss, Norway

Filed Apr. 4, 1973, Ser. No. 347,659

Claims priority, application Norway, Apr. 14, 1972, 1334/72

Int. Cl. A41d *13/00*

U.S. Cl. 2—2 3 Claims

A protective garment for enclosing and protecting the body of a wearer against poisonous gases or liquids. An outer non-permeable clothing layer is flexible but relatively stiff and has attached to the interior thereof an inner porous filter layer impregnated with an agent for neutralizing the poisonous substances. Ventilation openings are provided in the outer layer, said openings being covered by the inner porous layer and wherein a portion of the outer layer overlies the opening.

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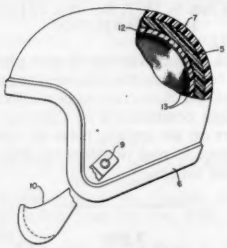
### 3,818,508
### PROTECTIVE HEADGEAR

Peter C. Lammers, Doylestown, and Frank N. Stefan, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 26, 1972, Ser. No. 317,966

Int. Cl. A42b *3/00*

U.S. Cl. 2—3 R 3 Claims



A protective headgear characterized by microporous semi-flexible polyurethane outer shell and a soft, flexible cellular liner, the outer shell having a density of about 30 to 42 pounds per cubic foot and a deflection test (Z-90 impact) of one inch at about one to 5 pound load and a temperature of 75°F.

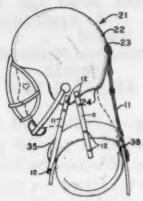
### 3,818,509
### APPARATUS FOR PREVENTING NECK INJURY

Leon E. Romo, Box 165 A Rt. 5, Annapolis, Md. 21401, and Jack T. Andrish, 120 E. 216 St., Euclid, Ohio 44123

Filed Aug. 24, 1973, Ser. No. 391,239

Int. Cl. A42b *1/08*

U.S. Cl. 2—3 R 16 Claims



An elastic strap for preventing neck injuries used in combination with a head piece and a body harness has fastening members thereon for engagement to a securing member on the head piece and on the body harness to limit the forward movement of the head piece.

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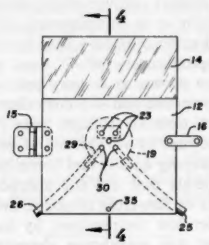
### 3,818,510
### FROST-FREE PROTECTIVE FACE AND HEAD ENCLOSURE

Dale F. Romann, 3180 70th St., East, Inver Grove Heights, Minn. 55075

Filed Oct. 25, 1972, Ser. No. 300,475

Int. Cl. A41d *13/00*

U.S. Cl. 2—9 9 Claims

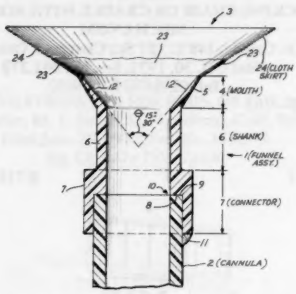


A frost-free face and head enclosure which is provided with means for use in cold environments and which maintains a substantially frost-free condition for visibility by the wearer. The enclosure is preferably comprised of a generally rigid helmet or head covering means with a face mask means for covering the face of the wearer. The face mask includes a transparent eye covering shield, and an isolating breathing chamber is provided within the confines of the face mask. The breathing chamber has means for effectively receiving ambient air to be breathed by the wearer, and for discharging exhaled air. Means are also provided for substantially continuously passing the ambient air through the discharge means to assist in reducing accumulation of frost.

## 3,818,511
## MEDICAL PROSTHESIS FOR DUCTS OR CONDUITS

Edward M. Goldberg, Glencoe; Seymour Bazell, Skokie, and Ralph G. Ostensen, Morton Grove, all of Ill., assignors to Medical Products Corporation, Skokie, Ill.

Filed Nov. 17, 1972, Ser. No. 307,641
Int. Cl. A61f 1/24; A61m 5/00, 25/00
U.S. Cl. 3—1 9 Claims

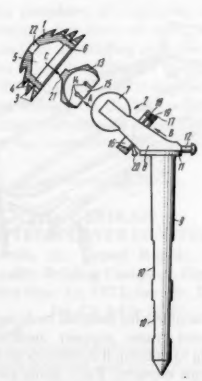



Medical prosthesis for ducts or conduits and method of manufacture. An exemplary embodiment is an arteriovenous shunt having a cannula terminated in a funnel in which the interior included angle ranges from 15° – 30°. The funnel is of an implantable, resilient silicone rubber into which a woven, flexible Dacron skirt is molded to enable suturing and tissue ingrowth at the anastomotic juncture. The silicone is of a medical type which is body tissue-compatible, and has sufficient elasticity and resilience to permit compliance during pulsatile fluid flow, storage and return of fluid kinetic energy, and accommodation to various sizes of vessels, ducts, or conduits. Actual experimental use shows improved results compared to prior types of tip-type cannulae.

## 3,818,512
## ARTIFICIAL HIP-JOINT WITH DETACHABLE INSERT

Yakov Isaevich Shersher, 1 Degtyarny proezd, 3, kv. 43, Saratov, U.S.S.R.

Filed May 8, 1973, Ser. No. 358,320
Int. Cl. A61f 1/24
U.S. Cl. 3—1 1 Claim

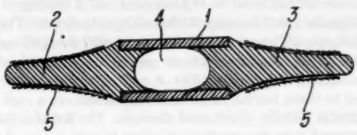


An artificial hip-joint, wherein an endoprosthesis of the patient's acetabulum is hinged to an endoprosthesis of the proximal end of the patient's femur by way of an insertion piece. The height of the cavity defined by the interior spherical surface of the insertion piece is greater than the radius, but smaller than the diameter, of the head of the endoprosthesis of the proximal end of the femur. There are cut-outs in the distal portion of the insertion piece, with the blades between the cut-outs forming a collet enveloping the head. The insertion piece is fixed in the seat of the endoprosthesis of the acetabulum by a self-locking nut.

## 3,818,513
## IMPLANTABLE JOINT PROSTHESIS

Jean Pillet, Paris, France, assignor to Rhone-Poulenc S.A., Paris, France

Filed Oct. 26, 1972, Ser. No. 300,967
Claims priority, application France, Oct. 27, 1971, 71.38605
Int. Cl. A61f 1/24
U.S. Cl. 3—1 5 Claims

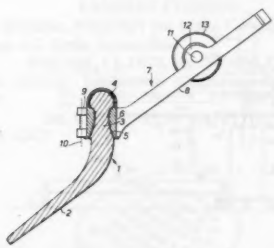



Implantable prosthesis of a joint comprising a central flexible hollow body portion, in the form of a tube of silicone elastomer, into the ends of which are inserted medullary pins of the same material, to extend outwardly from the body portion for insertion into the medullary ducts of the bones to be joined. The pins may be adhesively secured to the bones, or at least partly surrounded by a textile sheath colonizable by bone tissue. The cavity may be filled with sterile air or liquid.

## 3,818,514
## FEMORAL PROSTHESIS WITH REMOVABLE PROTECTIVE SHEATH

Bernard Clark, Pool-in-Wharfedale, England, assignor to Chas. F. Thackray Limited, Leeds, Yorkshire, England

Filed July 25, 1972, Ser. No. 275,053
Claims priority, application Great Britain, Aug. 9, 1972, 37247/72
Int. Cl. A61f 1/24
U.S. Cl. 3—1 12 Claims

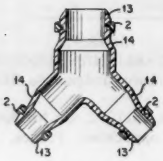


A protective sheath for at least the neck of a femoral prosthesis, said sheath being substantially incompressible and having an inner surface shaped so as to be complementary to the shape of said femoral prosthesis neck, and an outer surface which is substantially cylindrical. The sheath may also cover the head of the prosthesis.

## 3,818,515
## BIFURCATED TRACHEO-BRONCHIAL PROSTHESES

William E. Neville, 11 Brentwood Rd., Chatam, N.J. 07928

Filed Nov. 13, 1972, Ser. No. 305,661
Int. Cl. A61f 1/22
U.S. Cl. 3—1 5 Claims

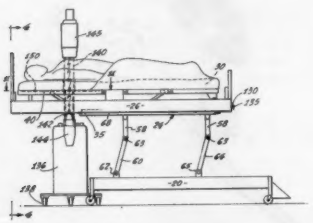


A prosthetic device for implantation into the tracheobronchial tree in replacement of a damaged or diseased trachea and one or both bronchi is disclosed. The device comprises a bifurcated tube having a cuff or cuffs on either distal end of the arms which are to be inserted into and anastomosed with the bronchi. A central or trunk tube is connected to these lateral tubes and may also have a cuff like arrangement distally positioned thereon. The central tube is to be inserted into the trachea or what is remaining of the endothoracic trachea. The bifurcated tube structure is comprised of a molded polysiloxane-epoxide substrate having positioned depression therein within which depressions a porous fabric like mesh is partially recessed so as to completely circumvent the exterior of the tube. These cuffs are of a polyester fabric and form one or more circumferential sleeves about the tube. The particular structural arrangement gives a smooth interior surface to the implant, little tissue reactivity and excellent flex to the device coupled with an outer surface which is conducive to excellent fibroblastic ingrowth of the surrounding tissue as well as permitting "blooding" of the connection between the natural body tissue and the implant.

## 3,818,516
## MOBILE HOSPITAL BED TO FACILITATE X-RAY EXAMINATIONS

Paul J. Hopper, Cerritos; Jack D. Kleinpeter, Hawthorne, and Dominic C. Milano, Los Angeles, all of Calif., assignors to Centinela Hospital Association, d/b/a Centinela Valley Community Hospital, Inglewood, Calif.

Filed Jan. 4, 1973, Ser. No. 321,022
Int. Cl. A61g 7/10; G03b 41/16
U.S. Cl. 5—67 23 Claims

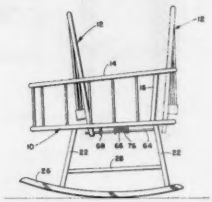


The hospital bed is adjustable as usual for height, tilt, elevated back rest and elevated knees, and is also mounted on wheels for use to transport the patient. In addition, the upper bed section that carries the mattress is slidable longitudinally to carry the upper part of a reclining patient forward beyond the rest of the bed structure to an extended position which affords ample clearance for special X-ray equipment, both above and below the extended section of the bed. The extended portion of the bed section is transparent to X-rays to permit X-ray examination of the upper part of the reclining patient's body without the necessity of handling or disturbing the reclining patient. A releasable latch normally retains the extendable bed section at its retracted position.

## 3,818,517
## ROCKING CHAIR OR CRADLE WITH ROCKING MECHANISM

Michael D. Casella, 248 E. 151 St., Cleveland, Ohio 44110

Filed Oct. 30, 1972, Ser. No. 302,278
Int. Cl. A47d 9/00, 9/02
U.S. Cl. 5—105 8 Claims

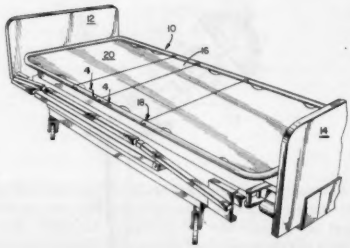


The apparatus of the present invention may be made convertible to permit use either as a rocking chair or cradle, and in either form a rocking mechanism may be associated therewith for obtaining the desired rocking mechanism. To convert the apparatus from a rocker to a cradle or vice versa, a movable back section is provided which may be releasably locked in either of two positions to permit quick and easy adjustment of the back section from one position to the other.

## 3,818,518
## PIVOT JOINT FOR BEDS

Roland A. Benoit, Danielson, and Richard H. Duprey, Dayville, both of Conn., assignors to Interroyal Corporation, New York, N.Y.

Filed Aug. 10, 1972, Ser. No. 279,637
Int. Cl. A47c 19/00
U.S. Cl. 5—200 C 3 Claims



A pivot joint particularly for hospital beds includes two hollow tubular mattress frame support members which are adapted to extend in longitudinal directions and each of which receives a pivot joint element. Each pivot joint element includes a substantially vertically extending member in the form of a column or tube which receives a clamping member such as a screw for clamping the joint element to the associated tubular frame of the bed. In addition to the vertical members, the pivot joint element includes cross-members extending

transversely. One, or both, of the cross-members is provided with a slot extending inwardly therefrom which is adapted to be aligned with a slot of the tubular member and a support element or web for the mattress frame extends into the slot and is secured therein after the pivot member is secured to the tubular member. Each pivot joint member includes an arm portion which extends outwardly from the hollow tubular frame and which includes a transverse opening for a pivot pin to extend therethrough for pivotally connecting the joint elements together.

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**3,818,519**

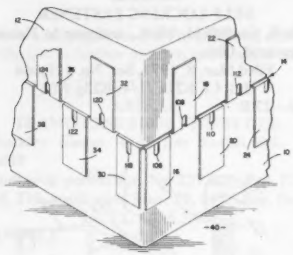
**BEARING STRESS PAD FOR BEDS, OR THE LIKE**

**Paul S. Schuder, Rt. 1, Box 1155, Woodland, Calif. 95695**

**Filed June 25, 1973, Ser. No. 373,379**

**Int. Cl. A47c** *7/08, 21/00*

**U.S. Cl. 5—317 R** **10 Claims**



A basket-weave matrix of flat strips having at least buttonholes at the intersections of the strips on the outer rows of the matrix and having extensions at both ends of said strips which are adapted to bend upward and downward forming enclosures for a top and a bottom mattress. The pad is placed over the bottom mattress with alternate juxtaposed strips of the matrix having downstanding tabs forming an enclosure for the bottom mattress and the remaining juxtaposed strips being upstanding and forming an enclosure for the upper mattress. The outside surfaces of the tabs may have buttons to receive buttonholes on the periphery of a covering sheet. Optionally, a supporting structure has rows of studs with buttons on the ends thereof, and the upstanding and downstanding tabs have clearance holes through which the studs penetrate allowing the button on the end of the stud to penetrate a pair of strips at the intersection thereof on the outer rows of the matrix. If desired, additional studs may be inserted between overlapping strips at each of the intersections thereof.

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**3,818,520**

**MATTRESS COVER CONSTRUCTION**

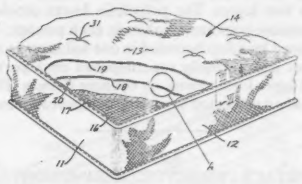
**Carl H. Richards, Jr., Grand Rapids, Mich., assignor to Richard's Quality Bedding Company, Grand Rapids, Mich.**

**Filed Mar. 13, 1972, Ser. No. 234,043**

**Int. Cl. A47c** *27/08*

**U.S. Cl. 5—345 R** **4 Claims**

A flexible, fire resistant mattress cover construction having a layer of padding material, one surface of which is covered by a layer of normally flammable cloth material and a layer of heat conducting metallic foil. The entire surface of the foil is bonded to the cloth material so that the foil is located between the padding material and the cloth material. The foil serves to prevent the flammable cloth material from bursting into flame when the cloth material is subjected to temperatures above the level at which combustion would normally occur by conducting the heat away from the location of application of heat to the cloth material.



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**3,818,521**

**MATTRESS COVER CONSTRUCTION**

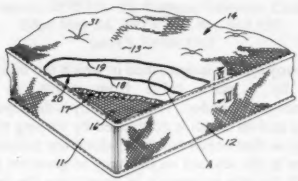
**Carl H. Richards, Jr., Grand Rapids, Mich., assignor to Richard's Quality Bedding Company, Grand Rapids, Mich.**

**Continuation-in-part of Ser. No. 234,043, March 13, 1972.**

**This application Dec. 4, 1972, Ser. No. 312,038**

**Int. Cl. A47c** *27/00, 31/00*

**U.S. Cl. 5—345 R** **13 Claims**



A flexible, fire resistant mattress cover construction having a layer of padding material, one surface of which is covered by a layer of normally flammable cloth material and a layer of heat conducting metallic foil located between the padding material and the cloth material. The foil serves to prevent the flammable cloth material from bursting into flame when the cloth material is subjected to temperatures above the level at which combustion would normally occur by conducting the heat away from the location of application of heat to the cloth material.

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**3,818,522**

**LAMINAR CUSHION**

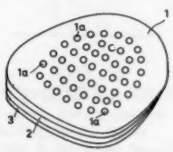
**Wilhelm Schuster, Frankfurt am Main, Germany, assignor to Calottan AG, Basle, Switzerland**

**Filed Apr. 12, 1973, Ser. No. 350,338**

**Claims priority, application Germany, Apr. 13, 1972, 2217759**

**Int. Cl. B32b** *33/00;* **A47c** *27/22*

**U.S. Cl. 5—347** **8 Claims**



A cushion consisting of three layers of foam plastic or foam rubber separated by double layers of polyolefin foil. The

layers of foam material are each formed with a multiplicity of passages extending in the direction of layer thickness, and the passages in each layer are aligned with respective passages in the other two layers. The polyolefin layers provide two integral, pressure-responsive valves in each passage, each valve being formed by a flap bounded in one foil layer by a crescent-shaped cut and normally superimposed on a portion of the other foil layer formed with an opening therein. The cushion breathes when subjected to varying compressive stresses.

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**3,818,523**

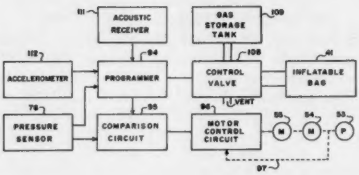
**SUBSURFACE CURRENT UTILIZING BUOY SYSTEM**

**Stephen L. Stillman, Jr., Hollis, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.**

**Filed Oct. 18, 1971, Ser. No. 190,019**

**Int. Cl. B63b** *21/52*

**U.S. Cl. 9—8 R** **24 Claims**




A sonobuoy system is described in which the buoy proper is anchored by a slack cable from which an array of hydrophones is suspended. The sonobuoy is deployed beneath the surface and its depth is controlled by varying the attitude of the buoy so that ocean currents, which are present virtually everywhere in the sea, act on the buoy to generate positive or negative lift thereby increasing or decreasing the depth in accordance with a predetermined program or on command. Vanes attached to the buoy augment the lift of the body of the buoy. Attitude is changed by pumping water between fore and aft tanks. Provision is made for bringing the buoy to the surface from time to time to abstract the information which has been gathered.

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**3,818,524**

**DEEP-SEA SLACK WIRE MOORING SYSTEM**

**Bertrand J. Starkey, Saanichton, B. C., Canada, assignor to Hermes Electronics Limited, Dartmouth, Nova Scotia, Canada**

**Filed Jan. 22, 1973, Ser. No. 325,634**

**Claims priority, application Canada, July 4, 1972, 146263**

**Int. Cl. B63b** *21/52*

**U.S. Cl. 9—8 R** **10 Claims**

Apparatus for use in slack line mooring systems, especially those having an "N" configuration, which is useful for mooring bodies floating in water of unknown depth and which includes an anchoring device adapted to descend to and rest on the floor of a body of water. A cable storage means is associated with the anchoring device for storing a length of cable and is adapted to pay out, upon deployment of the anchoring device, a length D of cable therefrom approximately equal to the vertical distance between the floor of the body of water on which the anchor is to rest and the surface of said water. Of fundamental importance to the apparatus is the provision of means, adapted to be preconditioned by the magnitude of said length D of cable paid out, for permitting said cable storage means to pay out an additional length X of cable so related to said length D that the "Scope" of the cable system as determined by the ratio of said lengths according to the formula $(D + X/D)$ assumes a suitable value, whereby to permit said cable to assume a configuration, especially an N configuration, under slack cable conditions of such proportions as to minimize the possibility of damage thereto which might otherwise result from an excess or deficiency of slack in said cable.

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**3,818,525**

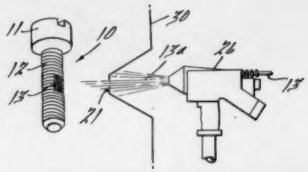
**SELF-LOCKING FASTENER**

**Ram D. Bedi, Southfield, Mich., assignor to Eaton Corporation, Cleveland, Ohio**

**Filed Mar. 8, 1971, Ser. No. 121,664**

**Int. Cl. B21k** *1/44;* **B23g** *9/00*

**U.S. Cl. 10—27 R** **10 Claims**




Self-locking fasteners, and method of making same; more particularly, metal fasteners wherein the self-locking characteristic is derived from a patch comprising a metal or metal alloy selectively applied to the surface of the metal fastener in a spraying operation.

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**3,818,526**

**PULLING AND LASTING MACHINES**

**Derek H. Garner; George H. Bosworth, and George C. Barton, all of Leicester, England, assignors to USM Corporation, Boston, Mass.**

**Filed Jan. 16, 1973, Ser. No. 324,246**

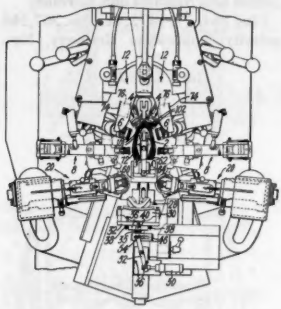
**Claims priority, application Great Britain, Jan. 18, 1972, 2380/72**

**Int. Cl. A43d** *21/00*

**U.S. Cl. 12—10.1** **5 Claims**

A machine for pulling and lasting a shoe upper has a plate for applying cement to an insole of the shoe having a knurled surface for applying the cement to forepart side portions of the insole and channels for applying the cement to toe portions of the insole. The machine also has wipers for pressing marginal portions of the upper forepart against the insole portions to which the plate has applied cement, including asymmetrically curved heelward portions of the insole forepart. Grippers adjacent the heelward portions of the insole forepart grip adjacent marginal portions of the upper and move downwardly and twistingly of a last over which the upper is positioned to tension the upper about the last. A control

responsive to a left or right shoe orientation of the machine then causes only one of the grippers at the inside of the right



or left shoe to additionally move inwardly and then upwardly relative to the last to further position and tension the upper.

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**3,818,527**

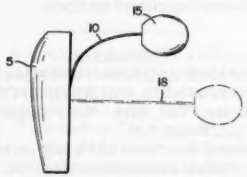
**TRANSVERSE SHOE STRETCHER**

**Mildred Rackley Simon, 4141 Los Arabis Rd., Lafayette, Calif. 94549**

**Continuation-in-part of Ser. No. 227,020, Feb. 17, 1972, abandoned. This application Mar. 29, 1973, Ser. No. 345,931**

**Int. Cl. A43d** *5/00*

**U.S. Cl. 12—115.6** **2 Claims**



An apparatus and method for relieving the pain of bunions and other foot discomforts caused by shoes too narrow in width. The apparatus comprises two form expanding members each beveled on one side and grooved on the other to receive interchangeably strips of spring steel of varying lengths. The beveled portions of the respective expanding members are placed against the opposing interior portions of that segment of the shoe to be stretched and an appropriate length of spring steel wedged between said members to deform said opposing sides to the desired width.

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**3,818,528**

**PORTABLE RAMP FOR WHEEL CHAIRS AND THE LIKE**

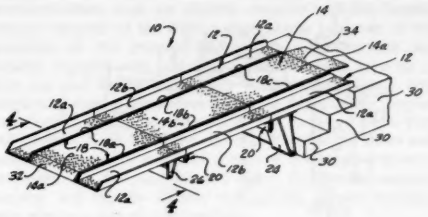
**Philip L. Petersen, 411 Fern Dell Pl., Glendora, Calif. 91740**

**Filed Oct. 4, 1972, Ser. No. 294,773**

**Int. Cl. E01d** *15/12*

**U.S. Cl. 14—72** **10 Claims**

A portable ramp embodying a number of longitudinal ramp members disposed side by side, each including a number of separate ramp sections arranged end to end, and hinges joining the adjacent ramp members and the adjacent ramp sections of each member in a manner such that the ramp may be folded laterally and endwise between an expanded configuration of use and a collapsed configuration in which the ramp may be conveniently stored and transported. The ramp is intended primarily for use as a wheel chair ramp for steps and the like, although the ramp may be used for other purposes.



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**3,818,529**

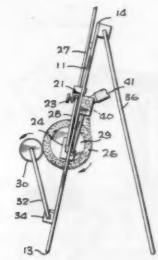
**PAINT ROLLER CLEANER**

**Guy O. Leggett, 25357 N. Via Ramon, Valencia, Calif. 91355**

**Filed May 24, 1973, Ser. No. 363,550**

**Int. Cl. B08b** *3/02*

**U.S. Cl. 15—1** **7 Claims**



A paint roller cleaner having a frame for rollably supporting at least one roller applicator in an elongated central cavity formed therein so that it is free to rotate on its spindle about a horizontal axis. A water jet assembly is disposed along the length of the cavity immediately adjacent the roller applicator. A plurality of jets are carried on a horizontally disposed conduit in the assembly that are directed to discharge a water jet stream against the periphery of the roller applicator. A connector is detachably coupled to a portion of the conduit for supplying pressurized water to the jets.

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**3,818,530**

**BRUSH SUPPORTING DEVICE FOR A CAR WASHER**

**Shigeo Takeuchi, Nagoya, Japan, assignor to Takeuchi Tekko Kabushiki Kaisha, Nagoya-shi, Japan**

**Filed Mar. 9, 1973, Ser. No. 339,600**

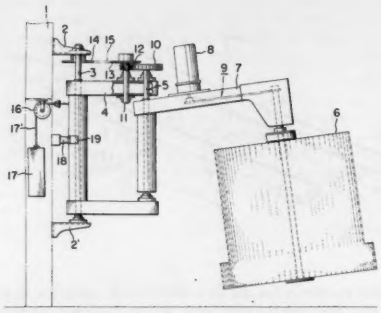
**Claims priority, application Japan, May 19, 1972, 47-49716**

**Int. Cl. B60s** *3/06*

**U.S. Cl. 15—21 D** **1 Claim**

A brush supporting device for a car washer adapted to wash vehicles of varying sizes, including a support arm structure

with a car-washing brush, motion transmitting wheels and an overspeed transmission mechanism connected between the



wheels. The device effects a compound pivoting motion to the brush-supporting arm to adapt motion thereof to the size of the vehicle being washed.

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**3,818,531**

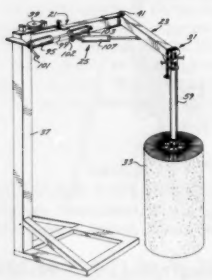
**BREAKAWAY OVERHEAD CAR WASH APPARATUS**

**Charles E. Saunders, New Canaan, Conn., assignor to The Allen Group, Inc., Melville, N.J.**

**Filed Nov. 8, 1972, Ser. No. 304,819**

**Int. Cl. B60s** *3/06*

**U.S. Cl. 15—21 D** **12 Claims**



Breakaway overhead car wash apparatus including a primary arm pivotally mounted on one end and having its free end projecting transversely over the path of a car to be washed with a secondary arm pivotally mounted therefrom and normally projecting rearwardly along such car path to carry a downwardly projecting rotary brush from the free end thereof for rotation about a vertical axis. The brush is suspended from the free end of such secondary arm by means of a breakaway brush carrier having a horizontal pivot axis and being operative in response to a predetermined amount of force being applied to such brush by a car moving forwardly along such path to release such carrier for pivoting of the brush about the horizontal axis. Consequently, when a car to be washed engages such brush, the secondary arm will be collapsed on the primary arm as the front of the car is washed and if such brush should become hung up on the front of such car thus preventing further free travel thereon and resulting in the predetermined force being applied to the brush, such brush will break away to pivot about the horizontal axis thus preventing damage to the washing apparatus or car.

**3,818,532**

**SWEEPER**

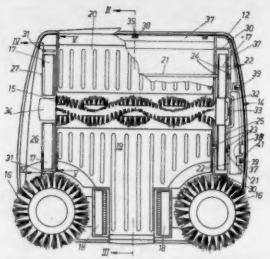
**Gunter Leifheit, and Johannes Liebscher, both of Nassau/Lahn, Germany, assignors to Leifheit International Gunter Leifheit KG, Nassau/Lahn, Germany**

**Filed Nov. 17, 1972, Ser. No. 307,566**

**Claims priority, application Germany, Nov. 23, 1971, 2157968**

**Int. Cl. A47l** *11/32*

**U.S. Cl. 15—42** **10 Claims**



A sweeper for rugs and carpets has a housing supported on a frame, a side of which faces the carpet or rug to be swept and is provided with recesses in which the shafts of one or more rotary brushes and/or of various supporting wheels for the housing are journalled for rotation. These recesses are bridged and closed by self-retaining closure members.

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**3,818,533**

**TREATED PAPER AND NON-WOVEN MATERIAL FOR WIPING SURFACES AND METHOD THEREFOR**

**Fred F. Scheuer, New York, N.Y., assignor to Alustikin Products, Inc., Bronx, N.Y.**

**Continuation of Ser. No. 843,223, July 18, 1969, Pat. No. 3,619,280, which is a continuation of Ser. No. 475,234, July 27, 1965, abandoned. This application Sept. 9, 1971, Ser. No. 179,190**

**Int. Cl. B08b** *1/00*

**U.S. Cl. 15—104.93** **4 Claims**

Tissue type paper and non-woven material are uniformly impregnated with a non-aqueous liquid carrier selected from liquid hydrocarbons, glycols, and pine oils containing an agent uniformly distributed therein automatically, by applying a predetermined quantity of treating fluid to any portion of the non-treated material. The agent is selected from waxes, silicones, and materials producing a predetermined odor. The agent does not separate from the carrier until at least the treated material is substantially impregnated, and the carrier and agent remain in the material substantially as when it was impregnated and are deposited in the same proportions as a thin film on a surface wiped by the material.

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**3,818,534**

**BRUSH**

**Gerard Benoni Boucherie, Rumbeke, Belgium, assignor to Firma G. P. Boucherie noamloze vennootschlap, Izegem, Belgium**

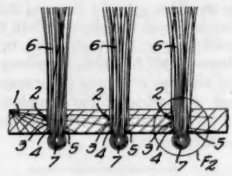
**Filed Mar. 30, 1972, Ser. No. 239,696**

**Int. Cl. A46b** *3/16*

**U.S. Cl. 15—195** **1 Claim**

A brush comprising a brush body provided with a a plurality of drilled holes passing therethrough, a tuft or bunch of fibres

being placed in each of said holes, said tuft or bunch being secured in said body, without any additional fastening means,



through an effect of mechanical expansion and/or friction, the backside of said body being preferably covered.

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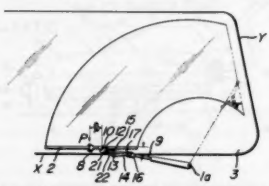
**3,818,535**
**WIPER DEVICE FOR VEHICLES**
**Isao Ito, Kamezakitakanecho-8-chome, Handa, Japan**
**Filed Aug. 1, 1972, Ser. No. 277,045**
**Claims priority, application Japan, Sept. 4, 1971, 46-68420**
**Int. Cl. B60s** *1/36*
**U.S. Cl. 15—250.23** **1 Claim**



A wiper blade is mounted to an end of a wiper arm which is driven to swing on the surface of a windshield of the vehicle. The wiper arm is divided into two members which are pivotally connected with each other so that the arm may be bent at the point of connection. The arm is bent at the point by the friction between the wiper blade and the surface of the windshield, so that the wiper blade may be in parallel to both the side edge and the lower bottom edge of the front glass so as not to obstruct the driver's view of the side mirror.

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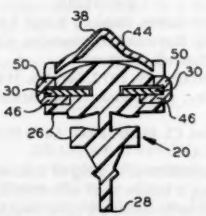
**3,818,536**
**WINDSHIELD WIPER ASSEMBLY**
**John J. Plisky, Munster, Ind., assignor to The Anderson Company, Gary, Ind.**
**Filed Aug. 29, 1972, Ser. No. 284,950**
**Int. Cl. B60s** *1/04, 1/38*
**U.S. Cl. 15—250.42** **5 Claims**



This invention relates to windshield wiper assemblies which include a wiping element comprising a flexible support member and a resilient wiping member and a pressure-distributing superstructure comprising elongate members operatively connected together so as to transmit and distribute the pressure received by the pressure-distributing superstructure from the wiper arm to spaced locations along the length of the wiping element. The pressure-distributing superstructure has members whose ends are slidably engaged with the flexible support member of the wiping element. At least two of the members of the pressure-distributing superstructure are slidably engaged with said support member and have on at least one end thereof a generally V-shaped upper part, tabs adapted to engage the undersides of the edges of the support member and arcuate portions joining the V-shaped upper part and the tabs. Each V-shaped upper part has, at the outer end thereof, a portion of each side displaced downwardly so as to be parallel to the plane of and above the flexible support member and thereby slidably engages the support member with minimum lateral rotational play.

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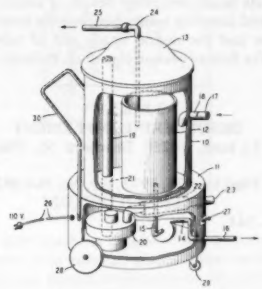
**3,818,537**
**HEATED LIQUID VACUUM GENERATOR FOR USE WITH A TWO CHAMBER CLEANING NOZZLE**
**James King Evans, Kutztown Rd. Box D, Reading, Pa. 19605**
**Filed Jan. 29, 1973, Ser. No. 327,720**
**Int. Cl. A47l** *7/00*
**U.S. Cl. 15—321** **5 Claims**



A compact liquid-vacuum generator for use with a two chamber cleaning nozzle in rug and upholstery cleaning features a cleaning solution supply tank within a larger vacuum tank on a portable housing. The vacuum tank is evacuated through a standpipe connected to a vacuum blower in the housing, and extending above the top of the solution tank. A vacuum inlet for connection to the cleaning nozzle enters the vacuum tank just below the top of the solution tank and extends downwardly therefrom. The vacuum tank is covered with a transparent dome containing a solution inlet pipe opening into the vacuum tank above the solution tank and connected to a remote reservoir of solution. By this arrangement, each time the cleaning nozzle engages the work surface, a vacuum is created in the tank sufficient to draw solution from the reservoir to replenish the solution tank. Spent cleaning solution is returned to the vacuum tank via the vacuum inlet. The presence of the solution tank within the vacuum tank not only provides compactness and enhances portability, but also provides a mechanism whereby excess spent solution will flow into the solution tank before it flows into the standpipe to the blower.

## 3,818,538
## WASHING APPARATUS

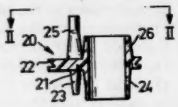
**Sven Erik Kraft, Kallby, Sweden, assignor to Industriaktiebolaget Broderna Larsson, Gotene, Switzerland**

**Filed Oct. 30, 1972, Ser. No. 301,802**

**Claims priority, application Sweden, Nov. 4, 1971, 14096/71**

**Int. Cl. A47l** *7/00*

**U.S. Cl. 15—322** **8 Claims**




This invention relates to a washing apparatus by which a washing medium is applied to a surface to be washed and removed from said surface by suction. The invention is concerned with a special construction of the means for coupling a multi-channel hose to a source of washing medium under pressure and a source of vacuum at one end and to a nozzle head both for spreading the washing medium onto the surface and for removing used medium from the surface at the other end. The apparatus is especially but not exclusively designed for washing the skin surface of bed ridden patients in a sick bed. The washing apparatus according to the invention comprises hose connecting members mounted on each end of a multi-channel hose with screw or bayonet coupling means and corresponding bayonet coupling sockets both on the nozzle head and on the source. The invention also comprises different types of nozzle heads and other details of construction of the connecting and coupling means between the source, the multi-channel hose and the nozzle heads and of valve means for shutting off the flow of pressure medium through the hose.

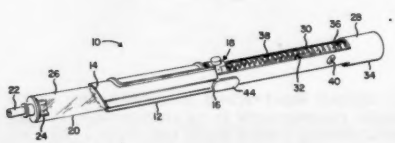
## 3,818,539
## DESOLDERING IMPLEMENT

**William S. Fortune, 14250 Dearborn St., Panorama City, Calif.**

**Filed May 25, 1973, Ser. No. 364,082**

**Int. Cl. A47l** *5/02, 5/24*

**U.S. Cl. 15—341** **4 Claims**




A hand held, hand operated tool is disclosed which has an outer cylindrical body and an inner, spring loaded plunger-piston assembly. The piston may be cocked and then held by a trigger mechanism in a forward position next to a nozzle or tip member. When the trigger is released, the piston flies back rearwardly drawing a sharp impulse of air into the cylindrical body through the nozzle member. A cocking shaft affixed to the plunger extends rearwardly out of the body and may be pushed forwardly into the body for each desired cocking stroke. A sheath for the cocking shaft is also carried by the body and is movable axially thereon. The rearward end of the sheath is closed and is engaged by the hand of the operator to push the cocking shaft into the cylindrical body of the implement. The cocking sheath is then returned by a second, light spring to its fully extended position, while the cocking shaft is held forwardly by the trigger mechanism. The cocking sheath provides both a handle and a protection covering for the cocking shaft.

The tip element is frictionally held within the forward end of the cylindrical body and is cleaned with each cocking stroke by the passage therethrough of a cleaning shaft affixed to and extending forwardly from the piston. When the cocking shaft is urged extraordinarily forwardly, the tip is particularly thoroughly cleaned and by further pushing of the cocking plunger, the tip member is ejected as for inspection, cleaning, or replacement. A reading of the complete specification is recommended for a full understanding of the principles and features of the disclosed tool.

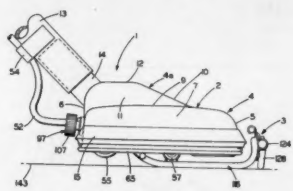
## 3,818,540
## COMBINED ADJUSTABLE SHAG RUG-POWER NOZZLE CLEANER CONSTRUCTION

**Eugene F. Martinec, East Cleveland, and Max L. Fairaizl, Chagrin Falls, both of Ohio, assignors to Health-Mor Inc., Chicago, Ill.**

**Filed Jan. 12, 1973, Ser. No. 322,959**

**Int. Cl. A47l** *5/34*

**U.S. Cl. 15—356** **7 Claims**




A suction cleaner nozzle having a power driven rotary brush mounted on the nozzle aligned with the nozzle inlet opening and a shag rug attachment mounted on adjustable nozzle supporting wheels. A motor is mounted on the nozzle and is connected to the brush by a belt for power driving the brush. The nozzle has a pair of front and rear wheels for roller supporting the nozzle when being used without the shag rug attachment. The front wheels are journaled on the ends of a pivotally mounted lever which is engaged by an eccentric cam for varying the nozzle inlet opening and brush height above a surface being cleaned. The shag rug attachment has a pair of spaced skid-like runners extending laterally of the nozzle inlet opening and a rake pivotally mounted at the front end of the runners. A pair of spring clips is mounted on the runners and detachably connect the shag rug attachment to the nozzle front wheels, whereby adjustment of the wheels by the lever varies the distance that the shag rug attachment is spaced below the nozzle inlet opening.

## 3,818,541
## CASTORS

**Raymond Robert James Daniels, Kings Lynn, England, assignor to Guy Raymond Engineering Company Limited, King's Lynn, Norfolk, England**

**Filed Dec. 29, 1972, Ser. No. 319,497**

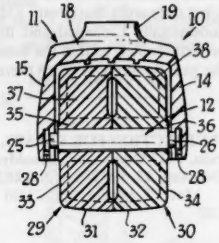
**Claims priority, application Great Britain, Jan. 7, 1972, 889/72**

**Int. Cl. B60b** *33/00;* **A47b** *89/00*

**U.S. Cl. 16—18 A** **4 Claims**

A castor for attachment to a leg or base of an article of furniture comprising a hollow shell of synthetic plastics material open at the bottom to receive a roller and having two spaced side walls. A shaft is mounted across the side walls of the shell, the shaft having grooved ends which are located in T-section sockets formed in the inner surfaces of the side walls of the shell so as to be hidden from view and so as to support and

retain the side walls of the shell against both compressive and bursting forces. A free running roller is mounted on the shaft




and vertical support means are provided on the shell, offset laterally from the shaft for mounting the shell pivotally on a supporting member.

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**3,818,542**

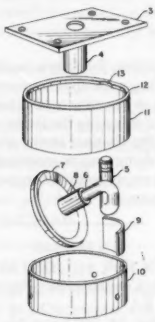
**OBSTACLE CLEARING ATTACHMENT FOR CASTER WHEELS**

**Robert L. Jones, 715 N. 55th St., Lincoln, Nebr. 68504**

**Filed Feb. 12, 1973, Ser. No. 331,897**

**Int. Cl. B60b** *33/00*

**U.S. Cl. 16—18 CG** **15 Claims**



A caster construction includes an obstacle clearing member supported continuously in advance of the path of rolling movement of the caster for free vertical movement above and preferably below the floor contacting surface of the caster wheel such that the clearing member preferably slides continuously along the floor to clear objects from the path of the wheel, but yet can move upwardly relative to the wheel should the wheel encounter a depression in the floor. The free vertical movement also compensates for wear along the lower edge of the member. The clearing member may be a cylindrical sleeve slidably supported or guided by a support means coupled to the caster swivel spindle or other appropriate part of the caster construction or the device to which the caster is attached. The attachment is particularly useful for mechanic's creeper wheels.

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**3,818,543**

**DRAPERY SUPPORT**

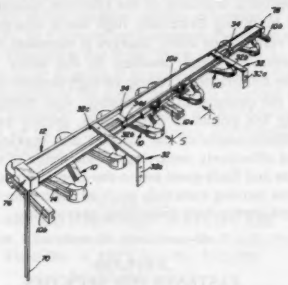
**George H. Baker, Sr., Dunlap, Ill., assignor to Baker Drapery Corporation, Peoria, Ill.**

**Filed June 14, 1971, Ser. No. 152,879**

**Int. Cl. A47h** *5/032, 13/12*

**U.S. Cl. 16—87.4 R** **12 Claims**

A traverse support fixture for draperies or the like which establishes and maintains the drapery folds and by which a drapery can be moved between open and closed positions, without the need for sewn pleats, special hooks or the like. A



plurality of drapery folding plates, different numbers of which can be installed, are mounted for movement along a track structure.

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**3,818,544**

**DRAW TRACK FOR DRAPES**

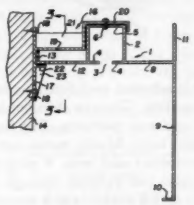
**Rupert C. Helmer, Port Moody, British Columbia, and Alan C. Johnson, Vancouver, British Columbia, both of Canada, assignors to Val-Trac Manufacturing Co. Ltd., Vancouver, British Columbia, Canada**

**Filed Feb. 20, 1973, Ser. No. 333,651**

**Claims priority, application Canada, Feb. 29, 1972, 135764**

**Int. Cl. A47h** *1/04*

**U.S. Cl. 16—94 D** **3 Claims**



A plastic draw track for drapes which is extruded integrally with a valance. Also moulded plastic drape carriers which are formed with four domed projections on the underside for engagement with the track, thus reducing friction. A support bracket may be provided which enables the track to be carried from a wall or window frame in those cases where the upper edge of the window opening is below ceiling level.

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**3,818,545**

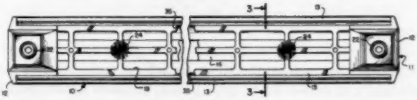
**RADIOACTIVE STATIC ELECTRICITY ELIMINATOR**

**Orval L. Olson, and Dusan Radosavljevic, both of Grand Island, N.Y., assignors to Nuclear Radiation Development, Inc., Grand Island, N.Y.**

**Filed Aug. 25, 1971, Ser. No. 174,642**

**Int. Cl. H05x** *3/02*

**U.S. Cl. 317—2 F** **22 Claims**



A radioactive device to remove static electricity charges including a radioactive foil maintained in a grounded housing

protected by a grounded metal grid, so located and of such physical dimensions, as to afford maximum protection against physical contact with the active element and minimum physical and electrical shielding of the effective radiations. For applications involving extremely high static charges, or where complete removal of static charges is essential, the grid may also incorporate metal brushes. In the latter version, the radioactive foil creates a region of high density ionization adjacent to the opening in the housing, with maximum density enveloping the points of the brushes, greatly enhancing the normal effectiveness of the brushes and making the device capable of effectively removing a wide range of static electrical charges and finds great use in the elimination of static electricity from moving materials such as paper, plastic, clothing, etc. created during their processing operation.

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**3,818,546**

**FASTENER FOR NECKTIES**

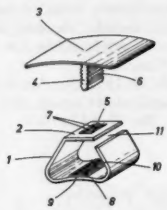
**Harald Kicher, Damaschkestrasse 20, Linz, Austria**

**Filed Dec. 11, 1972, Ser. No. 313,744**

**Claims priority, application Austria, Jan. 4, 1972, 27/72; Aug. 4, 1972, 6726/72**

**Int. Cl. A41d** *25/04;* **A44b** *17/00*

**U.S. Cl. 24—49 A** **6 Claims**




An eye member is adapted to define an opening and to embrace and hold a necktie. The eye member has diametrically opposite, forward and rear portions. The forward portion is formed with a radial hole. Spring means are carried by said eye member and constrict said hole. A plug pin is secured to an ornamental plaque and extends through said hole in engagement with said spring means and is adapted to extend approximately as far as to said rear portion.

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**3,818,547**

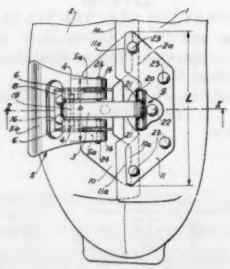
**TENSIONING LEVER BUCKLE, PARTICULARLY FOR PLASTIC SKI BOOTS**

**Loris Baso, Corso Milano 19, Padua, Italy**

**Filed Dec. 14, 1972, Ser. No. 315,080**

**Int. Cl. A43c** *11/14*

**U.S. Cl. 24—70 SK** **11 Claims**



A buckle for plastic ski boots having a toothed tensioning lever pivotally supported on one instep portion and a tension lever pivotally supported on the other instep member and having means thereon engageable with the gaps between the teeth on the toothed tensioning lever. The tension lever is constructed as a narrow member and has at its free end two lateral pins which project outwardly therefrom. The toothed tensioning lever is substantially U-shaped and the legs of the U-shaped member are toothed so that the tension lever engages the U-legs in the gaps between the teeth thereon.

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**3,818,548**

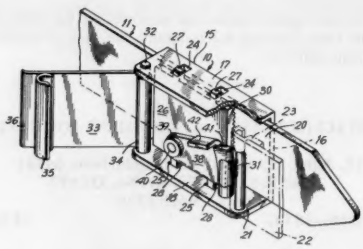
**BUCKLE CONSTRUCTION FOR STRAPS, AND THE LIKE**

**Stanley Meyerson, 1111 Ocean Ave., Brooklyn, N.Y. 11225**

**Filed Aug. 23, 1972, Ser. No. 283,086**

**Int. Cl. A44b** *11/12, 11/06*

**U.S. Cl. 24—170** **12 Claims**




A buckle construction for straps, such as watchbands and other straps, including a channel for receiving the strap, holding means movable in the channel against and away from the strap for holding and releasing the latter, abutment or reaction means mounted in the channel above or outward of the holding means, and wedging means mounted for movement into and out of wedging engagement interposed between the holding and reaction means.

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**3,818,549**

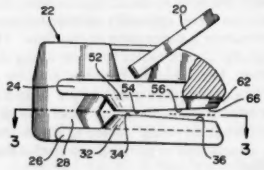
**SLIDER FOR A SLIDE FASTENER**

**George B. Moertel, Conneautville, Pa., assignor to Textron, Inc., Providence, R.I.**

**Filed Sept. 18, 1972, Ser. No. 289,853**

**Int. Cl. A44b** *19/26*

**U.S. Cl. 24—205.15 R** **9 Claims**




A slider for a slide fastener is constructed with a pair of wings joined at their front end portions by a spacer post and provided with lateral edge flanges extending to their rear portions. The edge flanges on one wing project toward the edge flanges on the other wing to define tape slots therebetween; surfaces on the edge flanges are arranged to control a minimum dimension for the tape slot and to absorb compressive forces on the rear portions of the wings.

## 3,818,550
## RETENTION DEVICES FOR SHEET MATERIAL

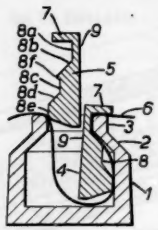
Harold William Cresswell, Treona Nurseries, Staunton, near Gloucester, England

Filed June 5, 1972, Ser. No. 259,848

Claims priority, application Great Britain, June 8, 1971, 19320/71

Int. Cl. A44b *21/00*

U.S. Cl. 24—243 K 7 Claims




A retention device for gripping, anchoring and/or tensioning sheet material, particularly plastics sheeting, comprises a wedge the thin end of which is extended for manipulation, the wedge including the extension thereof being split in at least two parts for successive insertion through a slot with sheet material wrapping surfaces of the wedge.

The slot may be formed in a structure to which the material is to be secured or in a support member to be secured to the structure.

In its preferred form, the device comprises flexible strips of angle section with an inner flange face having a ramp and step profile, two strips being inserted successively and back-to-back in a channel-section strip support to form a wedge looping the sheet material in the channel. Spaced wedge expanders may be pressed between the strips.

The device is particularly applicable for retention of plastics sheeting such as sheet polythene in canopies, hoods, greenhouses shelters and wind breaks.

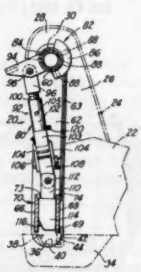
## 3,818,551
## QUICK HITCH ASSEMBLY

Samuel J. Coughran, Jr., Cedartown, Ga., assignor to Rome Industries, Cedartown, Ga.

Filed Feb. 27, 1973, Ser. No. 336,177

Int. Cl. A44b *21/00*

U.S. Cl. 24—243 FM 14 Claims



A quick hitch assembly for attaching a vehicle to a work implement includes a pair of latch members and means for extending the quick hitch assembly to engage the latch members in upwardly facing recesses of a hook assembly mounted on the work implement. In a first embodiment, the quick hitch assembly is manually extended by providing a swivel member pivoted on an upper frame member which is engaged in downwardly facing recesses of the hook assembly, the swivel member being connected to an over-center linkage whereby pivoting of the swivel member causes extension of the quick hitch assembly. In a second embodiment, hydraulic means are provided for extending the quick hitch assembly. In both embodiments, a guide housing is provided for the latching members and a shoulder of the guide housing is adapted to engage blocks in the upwardly facing recesses so that downward load will be taken up by the blocks, diverting any down load from the latching members.

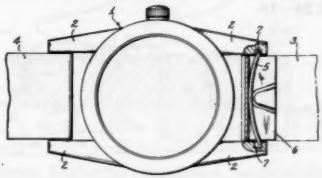
## 3,818,552
## BAR LUG FOR WRIST WATCH CASE

Francois Droz, Charriere 24, La Chaux-De-Fonds, Switzerland

Filed Dec. 4, 1972, Ser. No. 311,755

Int. Cl. A44c *5/18*

U.S. Cl. 24—265 B 5 Claims




A bar lug comprising a resilient wire element confined in an envelope so that the ends thereof can flex only in a single plane. The envelope is fitted on the end of a watch strap or band, and the bar lug is connected to the horns of a watch case by inserting the envelope between the horns while such is held at about a 90° angle to the plane of the watch case. After the ends of the bar lug have engaged with the horns the envelope is turned to lie generally parallel with the watch case, whereby the bar lug is prevented from disengagement and the strap or band is secured to the case.

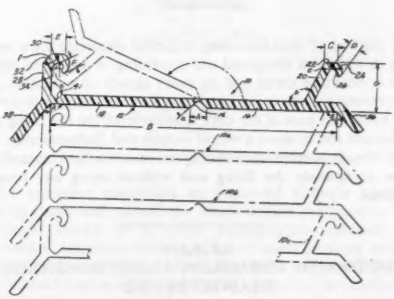
## 3,818,553
## BAG CLOSURE

Richard L. Parmenter, 952 Montecito Dr., Los Angeles, Calif. 90031

Filed Aug. 17, 1973, Ser. No. 389,349

Int. Cl. B65d *63/00*, *77/10*

U.S. Cl. 24—30.5 R 9 Claims



Bag closure clips according to this invention are contained in a continuous molded plastic strip to be rolled in a coil for storage in an automatic bagging machine. The closure clips are separated from the continuous strip and applied to the neck of a bread bag or the like to close the bag. Each closure clip includes a flat base having a transverse notch or hinge

which divides each base into a pair of hinged legs, a separate upwardly extending hook formed integrally with each leg, and a separate flange extending downwardly and outwardly from the outer edge of each leg. When the strip is rolled in a coil, the flanges engage hooks projecting from the closures in an adjacent layer of the roll, which keeps adjacent layers of the roll aligned with each other, and thereby facilitates use of the closure strip in an automatic bagging machine. The clip is applied to a bag by folding the legs about the hinge and releasably engaging the hooks in a snap fit. A second hinge formed in one of the legs enables the hooks to be easily moved from their engaged position when the clip is removed from the bag.

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**3,818,554**

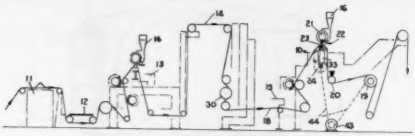
**PATTERN SHEARING DEVICE FOR PILE FABRICS**

**Ralph L. Davidson, Worcester, Mass., assignor to Curtis & Marble Machine Company, Worcester, Mass.**

**Filed Jan. 31, 1972, Ser. No. 222,075**

**Int. Cl. D06c** *23/02*

**U.S. Cl. 26—16** **3 Claims**



A textile shear having a blade and an endless belt with an embossed surface for supporting a pile fabric adjacent the knife. The endless belt, mounted on supporting means pivotable about a vertical axis for ease in pattern changing, includes longitudinal ridges to prevent longitudinal sliding thereof along a driven supporting roller and a carved pattern portion more elastic than the portion thereof being driven.

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**3,818,555**

**METHOD OF MANUFACTURING CENTRAL ELECTRODE FOR SPARK PLUG**

**Terumoto Yamaguchi, Anjo, and Kanemithi Izumi, Oobu, both of Japan, assignors to Nippondenso Co., Ltd., Kariya-shi Aichi-ken, Japan**

**Filed Mar. 16, 1973, Ser. No. 341,852**

**Claims priority, application Japan, Apr. 4, 1972, 47-034013**

**Int. Cl. H01t** *13/00*

**U.S. Cl. 29—25.12** **6 Claims**

A method of manufacturing a central electrode for a spark plug in which an elongated rod consisting of a core of highly heat conductive metal and an outer sheath of corrosion and heat resisting metal is cut into predetermined lengths to obtain unit rods, and part of the core is removed from the firing end of the unit rod to leave a recess in such end. Subsequently, the outer sheath portion surrounding the recess is bent inwardly to close completely the firing end without using any brazing material.

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**3,818,556**

**METHOD OF ASSEMBLING A GLOW DISCHARGE READOUT DEVICE**

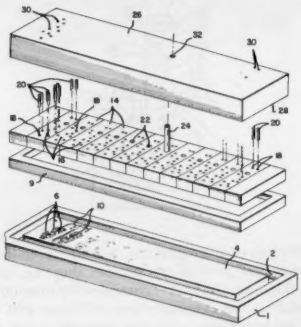
**Abul Abbas Mesbahuddin Ahmed, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.**

**Filed Oct. 25, 1972, Ser. No. 300,631**

**Int. Cl. H01j** *9/00*

**U.S. Cl. 29—25.14** **5 Claims**

In a glow discharge readout, cathodes are arranged on a glass substrate in electrical isolation from a plurality of anodes also on the substrate. Contact pins sealably imbedded in the substrate contact respective anodes and cathodes. A transparent cover forms a sealed envelope encasing the anodes and cathodes within an illuminating gas atmosphere. The anodes are purposely recessed with respect to the cathodes, whereupon an electrical potential impressed between the anodes and selected cathodes will cause electrons to flow from the cathodes to the anodes, the electron stream being focused toward the surface of the glass substrate and away from the transparent envelope thereby preventing electron collision



with the transparent envelope. According to the method of the present invention, cathodes are formed from particulate metal particles sintered under pressure and at a temperature below the melting point of the metal particles, but at a temperature sufficient to cause fusion of the substrate material. Upon fusion of the substrate in an inert atmosphere, the anodes, cathodes and contact pins are fused to the substrate simultaneously in a single operation. Applying molding pressure during fusion of the substrate will desirably recess the anodes from the cathodes.

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**3,818,557**

**METHOD OF MANUFACTURING AN IMPLOSION-FREE PICTURE TUBE FOR TELEVISION DISPLAY**

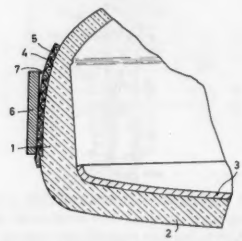
**Reinhart Charles Willem Eisses; Hendrik Bongenaar, and Theodorus Cornelis Gerardus Doreleijers, all of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Phillips Corporation, New York, N.Y.**

**Filed Jan. 3, 1972, Ser. No. 214,788**

**Claims priority, application Netherlands, Jan. 8, 1971, 7100273**

**Int. Cl. H01j** *9/18*

**U.S. Cl. 29—25.13** **8 Claims**



A picture tube in which a layer of synthetic resin consisting of an adhesive tape reinforced with a fabric is provided between a clamping band and the envelope, a possibly remain-

ing gap between the layer of synthetic resin and the clamping band being not filled.

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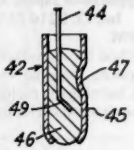
**3,818,558**
**METHOD OF MAKING LAMP CAP CONNECTIONS USING SUPERPLASTIC ALLOY**

**Arthur Samuel Vause, London, England, assignor to Thorn Electrical Industries Limited, London, England**

**Filed June 4, 1973, Ser. No. 366,739**
**Claims priority, application Great Britain, June 6, 1972, 26398/72**
**Int. Cl. H01j 9/18**
**U.S. Cl. 29—25.13** **8 Claims**




Electric lamps are disclosed having lead-in wires which extend out of the lamp envelopes and are connected to external electrical terminals, the terminals including hollow metal sleeves receiving the wires and the wires being joined thereto using alloys which exhibit superplastic behaviour, the alloys being heated, without melting, and caused to flow or creep superplastically into the sleeves and around the wires.

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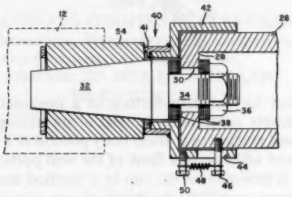
**3,818,559**
**BURNISHING TOOL**

**William Evan Benson, Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.**

**Filed Feb. 16, 1973, Ser. No. 333,201**
**Int. Cl. B21c 27/30; B24b 39/00**
**U.S. Cl. 29—90** **6 Claims**




A tool for burnishing the interior wall of a hollow, cylindrical workpiece includes a freewheeling mandrel for radially adjusting tapered rollers which are held in position by a stationary cage and which revolve around and burnish the interior wall of the workpiece. Burnishing can be accomplished by holding the workpiece stationary and rotating the tool or by holding the tool stationary and rotating the workpiece.

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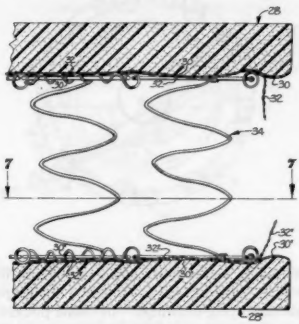
**3,818,560**
**METHOD OF MAKING FOAM CUSHIONS**

**Carl Gordon Bulloch, Jr., 76 Kimberly Ave., Asheville, N.C. 28804**

**Division of Ser. No. 130,328, April 1, 1971, Pat. No. 3,719,963. This application Oct. 19, 1972, Ser. No. 298,953**
**Int. Cl. B68g 7/00**
**U.S. Cl. 29—91.1** **10 Claims**

A method of making a foam cushion for use as a seat, mattress or the like including the steps of foaming a material in an open top mold to form a cellular pad having a dense upper crust, and supportingly positioning an open mesh fabric and an overlying spring assembly in floating relation on the foaming material. The open mesh fabric thereby becomes essentially embedded in the crust to reinforce the same, and the terminal face portions of the spring assembly are adhered to the crust to interconnect the various components. To form an innerspring mattress, the resulting structure is removed from the mold, inverted, and positioned on additional foaming material




in a like manner. In a further embodiment, the spring assembly is positioned on the pad after the foaming process is completed. In this case, the originally unattached foam pad may be easily stored or shipped to a point of assembly where the spring assembly is later joined by hog ringing or the like. In order to densify the foaming material in this latter embodiment, a screen member having a weight and outline generally similar to that of the spring assembly may be removably positioned on the foaming material during the foaming process.

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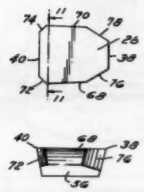
**3,818,561**
**CUT-OFF SAW AND SLOTTING CUTTER**

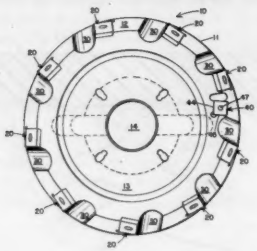
**Francis J. Montana, Farmington, and James A. Pawlik, Sterling Heights, both of Mich., assignors to The Valeron Corporation, Detroit, Mich.**

**Filed July 14, 1971, Ser. No. 162,484**
**Int. Cl. B26d 1/00**
**U.S. Cl. 29—95 R** **19 Claims**



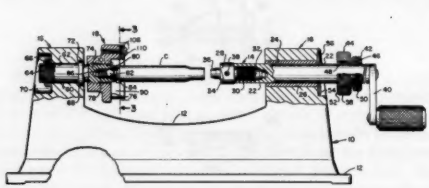

The invention comprises an improved multiple toothed slotting cutter and cut-off saw which utilizes replaceable and indexable inserts of a novel configuration retained by mechanical fastening means and novel insert locating means. Each insert has a narrow cutting edge and a wide cutting edge and in combination with the locating means can be positioned for a narrow cut at a slightly larger radius than the broad cut. In the preferred embodiment, the inserts are alternately positioned for wide and narrow cut around the periphery of the cutter, thus providing a very efficient configuration for a cut-off saw. When the insert cutting edges are dulled the inserts are merely reversed end for end to provide fresh cutting edges with the same alternating positions.

3,818,562
CUTTER BODY AND BLADE THEREFOR
Ralph W. Lacey, North Royalton, Ohio, assignor to Kysor Industrial Corporation, Cadillac, Mich.
Filed July 19, 1972, Ser. No. 273,138
Int. Cl. B26d 1/12
U.S. Cl. 29—105 A 12 Claims



An edge milling cutter body and cutter blade therefor indexable to eight cutting edges is described in this specification and the accompanying drawings. The blade pockets are positioned about the periphery of the body at a prescribed lead or corner angle, with the blades held therein generally parallel to the frusto-conical surface of the cutter body. The pockets are made such that the cutting edge of the blade will have a severe negative radial rake, a very slight negative axial rake, and a lead or corner angle such that the combination results in the blade edge having an effective cutting action of negative true rake and positive angle of inclination. The blade has a primary clearance angle extending about the periphery of each of its faces and a wiping and strengthening flat at each of the eight cutting corners.

3,818,563
WORK-HOLDING CHUCK AND CARTRIDGE-CASE TRIMMER EMPLOYING SAME
Richard G. Beaulieu, Columbia, Conn., assignor to The Leisure Group, Inc., Los Angeles, Calif.
Continuation of Ser. No. 153,194, June 15, 1971, abandoned. This application Sept. 21, 1972, Ser. No. 285,770
Int. Cl. F42b 5/26; B21d 51/54
U.S. Cl. 29—1.32 10 Claims

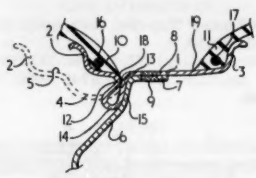


A work-holding chuck designed for use as a cartridge-case holder for reloading ammunition, especially in connection with a trimmer for cartridge cases, in which the holder is provided with a centering ball against which the empty primer pocket in the base of the case is held by retaining-fingers when the case is placed in the holder. The retaining-fingers are mounted so that they spread outward to receive and retain cartridge cases of all sizes and styles. When the holder is locked, the base of the cartridge-case is pressed by the retaining-fingers solidly against a cartridge-positioning surface of the holder through which the centering ball projects, thereby ensuring both exact centering of the head of the cartridge case and location thereof longitudinally with respect to a tool-positioning surface on the device such as a case trimmer, with which the holder is used.

3,818,564
METHOD FOR MANUFACTURE OF SELF-LUBRICATING, WEAR-RESISTANT COMPOSITE MATERIAL
Yuko Tsuya, Saitama-ken, and Hirofumi Shimura, Tokyo, both of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan
Continuation-in-part of Ser. No. 129,583, March 30, 1971, abandoned. This application Nov. 29, 1972, Ser. No. 310,268
Claims priority, application Japan, Apr. 2, 1970, 45-28070
Int. Cl. B21d 53/10
U.S. Cl. 29—149.5 PM 4 Claims

Disclosed is a method for manufacturing a self-lubricating, wear-resistant composite material by compressing a tiered array of copper nets, burning the molded skeleton in a vacuum and impregnating the sintered skeleton with a solid lubricant.

3,818,565
METHOD OF MAKING VEHICLE WHEELS
William Eric Mitchell, Coventry, England, assignor to Dunlop Limited, London, England
Continuation-in-part of Ser. No. 123,513, March 18, 1971, Pat. No. 3,708,847. This application July 12, 1972, Ser. No. 271,148
Claims priority, application Great Britain, July 15, 1971, 33164/71; Mar. 21, 1970, 13746/70
Int. Cl. B21h 1/02; B21k 1/32
U.S. Cl. 29—159.01 5 Claims

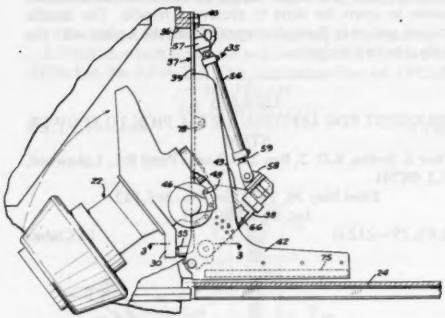


A method for the manufacture of a pneumatic tire and wheel assembly comprising welding a rim having a circumferential well portion to a wheel body portion at a position on the rim on or adjacent one flank of the well portion. A pneumatic tire is mounted on the rim by a method employing the well portion to enable the tire beads to pass over a rim flange, and subsequently at base the well portion of the rim is subjected to axial compresion so as to reduce the axial width of the well portion.

3,818,566
ALUMINUM ALLOY PRODUCTS AND SURFACE TREATMENT
William A. Anderson, and Edmund C. Franz, both of Pittsburgh, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.
Division of Ser. No. 37,339, May 14, 1970, abandoned. This application June 19, 1972, Ser. No. 263,767
Int. Cl. C23b 9/02
U.S. Cl. 29—195 8 Claims

An aluminum alloy containing 0.05 to 0.15% copper, 0.5 to 0.7% iron, 0.15 to 0.3% silicon, 0.3 to 0.6% manganese, the balance essentially aluminum when properly anodized acquires an attractive integral beige color. Sheet products fashioned from this material are useful in architectural applications such as covering the exterior of large buildings.

3,818,567
APPARATUS FOR POSITIONING JOURNAL ASSEMBLIES IN PULVERIZERS
Dominik J. Moro, York, Pa., assignor to American Chain & Cable Company, Inc., New York, N.Y.
Filed Mar. 29, 1973, Ser. No. 345,862
Int. Cl. B23p *19/00*
U.S. Cl. 29—200 D 22 Claims



An apparatus for removing and replacing journal assemblies in pulverizers comprising a frame adapted to be mounted adjacent the opening in a side wall of the pulverizer and a carriage which is mounted on the frame for pivotal movement to swing the journal assembly between positions within and without the housing and for movement away from the pulverizer to move the journal assembly clear of the housing for servicing.

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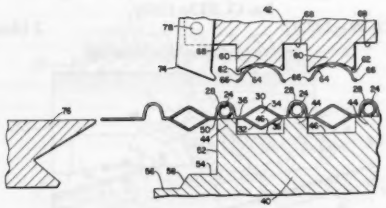
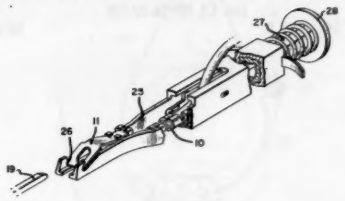
3,818,568
APPARATUS FOR FORMING HEAT EXCHANGERS
Harold R. Sennstrom, Waynesboro, Pa., assignor to Teledyne Mid-America Company, Los Angeles, Calif.
Filed Mar. 29, 1973, Ser. No. 346,120
Int. Cl. B23p *15/26*
U.S. Cl. 29—202 D 1 Claim



Apparatus for securing a backing sheet to a length of tubing to form heat exchange structure particularly useful as a condenser in a household refrigerator.

Spring fingers engage the sides of open grooves in the backing sheet in which the tubing is received to cause the walls of said grooves to be deformed to embrace the tubing and lock the tubing to the backing sheet.

3,818,569
RELEASING TOOL FOR MULTIPLE CONTACT
Robert John Kinkaid, New Cumberland, and John Carl Asick, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Division of Ser. No. 92,742, Nov. 25, 1970, Pat. No. 3,705,376.
This application Sept. 5, 1972, Ser. No. 285,983
Int. Cl. B25b *27/02*
U.S. Cl. 29—203 H 3 Claims



A tool for releasing an electrical contact of a connector assembly including a contact body having a crimped wire barrel portion and a channel portion with a finger-like spring mounted on the channel portion. An opening near a free end of the spring is located opposite one end of the channel permitting insertion of a conductive post through the opening and into the channel. The spring is appropriately biased to bite the post along one edge of the opening while releasing the post by use of a tool which applies a force at the end of the spring in the direction of the channel.

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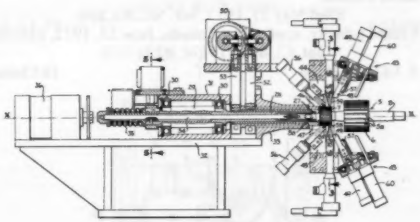
3,818,570
ARMATURE WINDING MACHINE WITH IMPROVED LEAD STAKING MEANS
Mario Del Bono, Florence, Italy, assignor to Possis Corporation, Minneapolis, Minn.
Filed May 2, 1973, Ser. No. 356,345
Claims priority, application Italy, May 17, 1972, 9485/72
Int. Cl. H02k *15/06*
U.S. Cl. 29—205 C 13 Claims



An armature winding machine of the type wherein the ending and starting leads of the coils successively wound onto the core by a pair of oppositely rotating flyers, are attached to the segments or bars of the commutator of the armature by stuffing them into slots cut into the bars, which machine is characterized by the provision of automatically functioning means to assure exact alignment between the lead tucking blades of the lead attaching instrumentalities and the commutator slots before the leads are driven into the slots, this being accomplished by optical sensing means which takes cognizance of the position of the commutator slot with respect to the lead attaching instrumentalities, produces a signal indicative of that relationship and initiates the operation of cor-

rective drive means by which the lead attaching instrumentalities are brought into exact alignment with the mouth of the slot.

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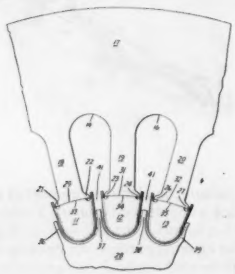
**3,818,571**

**APPARATUS FOR INSERTING WINDING TURNS**

**Richard B. Arnold, and Fredrick Koenig, both of Fort Wayne, Ind., assignors to General Electric Company, Fort Wayne, Ind.**

**Filed Apr. 6, 1973, Ser. No. 348,757**
**Int. Cl. H02k** *15/06*
**U.S. Cl. 29—205 R** **10 Claims**



Coil insertion tool elements have selected longitudinally extending surface portions contoured or curved to at least approximate curvature of bore defining surface of a tooth of laminated magnetic cores into which windings are to be injected. Tool elements include one or two tooth tip protecting or covering lips, and these lips or lip, rather than extending directly from curved surface portions, extend from relieved surface regions. These regions are at the arcuate extremities of longitudinally extending curved surfaces.

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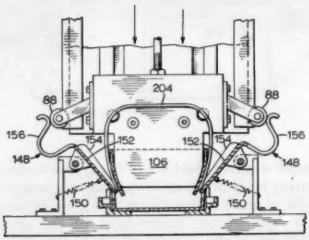
**3,818,572**

**MANUFACTURE OF FRUIT BASKETS AND THE LIKE**

**Theodore Alexander Burrell, Oakville, Ontario, Canada, assignor to Oakville Wood Specialties Limited, Oakville, Ontario, Canada**

**Filed May 21, 1973, Ser. No. 361,860**
**Claims priority, application Canada, June 23, 1972, 145480**
**Int. Cl. B23p** *19/04;* **B23q** *7/10*
**U.S. Cl. 29—208 B** **10 Claims**




An apparatus for mounting a handle on a basket such as a fruit basket having a pair of oppositely disposed side walls, each formed with the U-shaped slot to receive an end of a handle. The apparatus consists of a frame having a handle mounting station therein, means for mounting a basket in said handle mounting station and slot opening finger means disposed on opposite sides of the station and movable between a retracted position outwardly of the station and an extended position inwardly of the station to open the slots of a basket in use. Clamping means is also provided for clamping a handle in a position with the ends thereof aligned with the slots of a basket in said station. Drive means is also provided for moving the handle clamping means towards and away from the station, so that the handle clamping means may engage the slot opening finger means as the handle clamping means moves towards the station to cause the finger means to move to the extended position to open the slots to receive a handle. The handle clamping means is thereafter opened and the basket with the handle attached is ejected.

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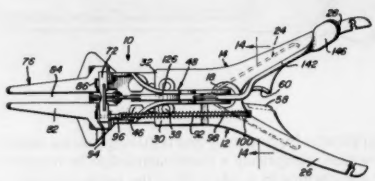
**3,818,573**

**IMPLEMENT FOR AFFIXING METAL PICK TO FLOWER STEM**

**Arthur J. Scotto, R.D. 2, Box 230, Lanes Pond Rd., Lakewood, N.J. 08701**

**Filed May 30, 1973, Ser. No. 365,142**
**Int. Cl. B23q** *7/10*
**U.S. Cl. 29—212 D** **14 Claims**



A portable implement having handle levers, pivotally connected to jaw assemblies for crimping the fingers on a sheet metal pick about the stem of a flower. The picks are displaced from a magazine by a slidable feed element into the jaw assemblies. A feed actuating mechanism is mounted on the lever handle assembly by a frame on which the feed and magazine are also carried.

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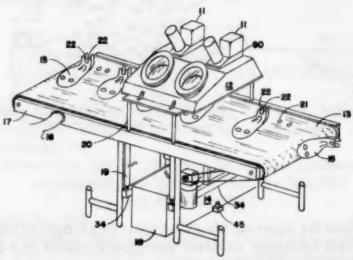
**3,818,574**

**CLOSING SYSTEM FOR BAGS AND THE LIKE**

**Philip L. Reid, Lyman, and Edward L. Holcombe, Taylors, both of S.C., assignors to W. R. Grace & Co., Duncan, S.C.**

**Division of Ser. No. 97,747, Dec. 14, 1970, Pat. No. 3,693,314.**
**This application July 3, 1972, Ser. No. 268,386**
**Int. Cl. B23p** *11/00*
**U.S. Cl. 29—243.57** **2 Claims**



Disclosed is an apparatus and method for closing containers and especially useful for closing bags containing vacuum

packaged products. The following features are included: means for straddling the bag's neck, means for positioning the bag's neck, means for pressure closing a clip, means for sensing that the pressure applied to close the clip is sufficient and associated apparatus for vacuumizing the bag.

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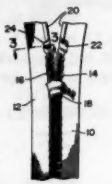
**3,818,575**
**METHOD OF FORMING END STOPS ON SLIDE FASTENERS**

**James R. Johnston, Meadville, and George B. Moertel, Conneautville, both of Pa., assignors to Textron Inc., Providence, R.I.**

**Division of Ser. No. 220,589, Jan. 25, 1971, Pat. No. 3,775,815, which is a division of Ser. No. 28,793, April 15, 1970, Pat. No. 3,686,719. This application May 14, 1973, Ser. No. 359,835**
**Int. Cl. B23p** *11/00*
**U.S. Cl. 29—408** **11 Claims**




A method of forming an end stop for a slide fastener including folding the slide fastener to have a T-configuration exposing the undersides of the folded portions, disposing fusible material in cavities below the exposed undersides and fusing the material to the undersides of the folded portions to form a separate stop member on either side of the slide fastener.

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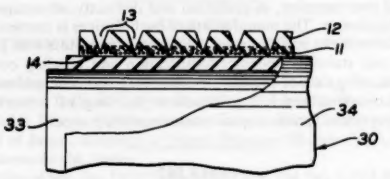
**3,818,576**
**METHOD FOR MANUFACTURING V BELTS**

**William D. Braden, Stow, and Richard P. Marshall, Tallmadge, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio**

**Division of Ser. No. 70,138, Sept. 8, 1970, Pat. No. 3,711,996. This application Sept. 28, 1972, Ser. No. 293,295**
**Int. Cl. B23p** *17/00*
**U.S. Cl. 29—414** **2 Claims**

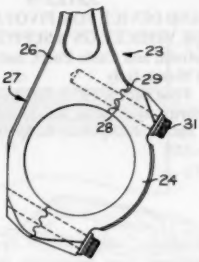



A cylindrical cured cord reinforced rubber sleeve is rigidly supported on rotatable, expandable mandrel, the mandrel is rotated about is longitudinal axis, a plurality of rotating grinding wheels are passed by the peripheral surface of the mandrel in a direction perpendicular to the longitudinal axis of the mandrel and engage the sleeve to cut peripheral grooves in the sleeve, and a plurality of rotating cutting blades pass the peripheral surface of the mandrel in a similar manner to sever the sleeve into a plurality of V belts.

**3,818,577**
**CONNECTING ROD MANUFACTURING**

**John M. Bailey, Dunlap, and Donald G. Zook, Metamora, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.**

**Division of Ser. No. 106,804, Jan. 15, 1971. This application July 31, 1972, Ser. No. 276,571**
**Int. Cl. B23p** *17/00*
**U.S. Cl. 29—413** **8 Claims**




High quality connecting rods and similar machine components comprised of an assembly of two clamped together parts are manufactured from tough heat treated high carbon steel, or the like, according to a manufacturing method of reduced cost. Essentially all machining of the component is conducted on an integral piece prior to its being divided into the two separate parts by fracturing along a frangible zone effected by electron beam bombardment. The resulting irregular mating surfaces of the respective parts have substantial resistance to relative sliding upon clamping of the parts together.

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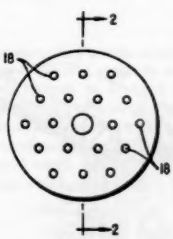
**3,818,578**
**METHOD OF CASTING AND WORKING A BILLET HAVING A PLURALITY OF OPENINGS THEREIN**

**Jan Wayne Raymond, and Clay N. Whetstone, both of Denver, Colo., assignors to Cyromagnetics Corporation, Denver, Colo.**

**Division of Ser. No. 47,390, June 18, 1970. This application Sept. 24, 1971, Ser. No. 183,578**
**Int. Cl. B23k** *19/00*
**U.S. Cl. 29—527.5** **4 Claims**




A plurality of rods are assembled in a predetermined configuration to form a core which is surrounded by a molten matrix metal within a heated crucible. The temperature of the thusly charged crucible's upper portion is maintained above the matrix metal's melting point. In this respect, as the heat is applied to the top of the melt, the crucible is maintained in a hot environment while the bottom of the crucible is centrally chilled. In this manner the charge is solidified from the bottom toward the top so that the solidification progresses upwardly and outwardly in a conical pattern. After the controlled solidification is completed the casting is separated from the

crucible to form a cored extrusion billet. In one embodiment the rods are separated from the casting and the resulting open holes are filled with superconductive material to form a composite superconductor extrusion billet. In another embodiment the rods themselves are made of a superconductive material so as to eliminate the step of separating the rods from the casting.

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**3,818,579**

**METHOD AND DEVICE FOR PIVOTALLY MOUNTING A MOTOR VEHICLE ON A SUPPORTING FRAME**

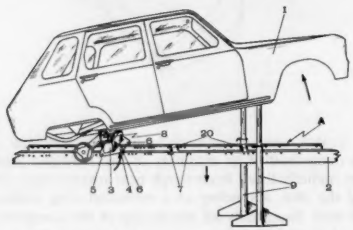
**Giuseppe Pietrelli, and Carlo Pucci, both of Piazza Betti n. 46, Marina Di Massa, Italy**

**Filed Feb. 5, 1973, Ser. No. 329,363**

**Claims priority, application Italy, June 12, 1972, 68873-72**

**Int. Cl. B23q** *7/00*; **B23p** *7/00, 19/00*

**U.S. Cl. 29—559** **8 Claims**



A method and device for pivotally mounting a motor vehicle on a supporting frame of a motor vehicle lift bench so that the motor vehicle can be tilted or rotated to permit access to the underside of the motor vehicle for repairing or checking parts thereof, the motor vehicle being rotated about a fulcrum formed by front and rear mounting means carried by the supporting frame.

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**3,818,580**

**MACHINE TOOL WITH AUTOMATIC TOOL-CHANGE**

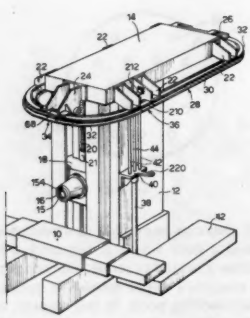
**Elio Pagella, and Giorgio Ollearo, both of Ivrea, Italy, assignors to Ing. C. Olivetti & Co., S.p.A., Ivrea (Turin), Italy**

**Filed July 30, 1971, Ser. No. 167,771**

**Claims priority, application Italy, Aug. 28, 1970, 69910/70**

**Int. Cl. B23q** *3/157*

**U.S. Cl. 29—568** **28 Claims**



A machining centre has a tool-storage magazine in the form of an endless track along which a series of carriages is slidable. Each carriage releasably carries a tool holder. A portion of the track at a tool-change station is movable, and forms part of a tool-change arm that is movable between a position in which the movable portion completes the track, and another position in which the carriage in the movable portion is located at the spindle. Means is provided for releasing the tool holder from the carriage when it reaches the spindle. The carriages are driven along the track by contact with each other, the train of carriages being driven by a toothed wheel engaging rollers on the carriages. Another portion of the track is movable on a guide to a tool substitution station located at a place conveniently accessible to an operator.

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**3,818,581**

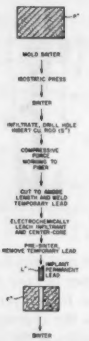
**CAPACITOR ELECTRODE**

**Haig Vartanian, Newton; Alan W. Postlethwaite, Cambridge, both of Mass., and Robert Y. L. Mao, Glenbrook, Conn., assignors to Norton Company, Worcester, Mass.**

**Filed Sept. 28, 1972, Ser. No. 293,114**

**Int. Cl. B01j** *17/00*

**U.S. Cl. 29—570** **13 Claims**



Improved capacitor anodes, and like products, in which the product is produced by sintering a powder compact, working the compact down to a smaller shape through the application of compressive forces and in such fashion that the individual powder particles are stretched into fibers to form a resultant electrode product of interconnected elongated fibers with elongated metallurgical bonds corresponding to the original powder-to-powder bonds. The improvement comprises forming a very dense core or backing layer in the elongated end product. The core facilitates an attachment of lead wires and avoidance of impurities in the product. It is formed by providing a dense core in the original powder compact either through a graded density of powder therein or insertion of a solid core member, in preferred and distinctly advantageous embodiments. The manufacture of such devices is carried out in a manner to produce solid electrolytic capacitors with good life test stability. Specific densification and bonding conditions, using a sinter-press-sinter three stage process, and extrusion working and electrochemical leaching of a working matrix afford further improvement in performance.

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**3,818,582**

**METHODS OF PRODUCING FIELD EFFECT TRANSISTORS HAVING INSULATED CONTROL ELECTRODES**

**Reinhold Kaiser, Heilbronn, Germany, assignor to Licentia Patent Verwaltungs GmbH, Frankfurt am Main, Germany**

**Filed Mar. 4, 1971, Ser. No. 120,917**

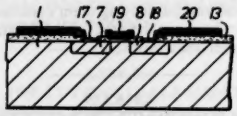
**Claims priority, application Germany, May 5, 1970, 2021923**

**Int. Cl. B01j** *17/00*

**U.S. Cl. 29—571** **9 Claims**

A method of producing a field effect transistor having an insulated gate electrode in which at least one surface of a semi-

conductor body is covered with an insulating layer, a region of the insulating layer is covered with a metal layer to form the




gate electrode and contact-making windows are introduced into the insulating layer to make contact with a source and drain electrode provided in the semi-conductor body.

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**3,818,583**

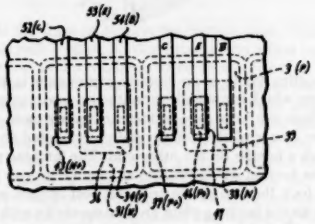
**METHOD FOR FABRICATING SEMICONDUCTOR STRUCTURE HAVING COMPLEMENTARY DEVICES**

**Bohumil Polata, Los Altos, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.**

**Continuation-in-part of Ser. No. 53,179, July 8, 1970, abandoned, which is a division of Ser. No. 791,656, Jan. 16, 1969, abandoned. This application Sept. 25, 1972, Ser. No. 291,679**

**Int. Cl. B01j** *17/00*

**U.S. Cl. 29—578** **8 Claims**




Method for fabricating a semiconductor structure having complementary devices in which islands of one conductivity are formed by a backside diffusion into a semiconductor body of opposite conductivity type to provide regions of first and second conductivities which are subsequently dielectrically isolated before the formation of the complementary devices therein.

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**3,818,584**

**METHOD FOR MANUFACTURING A SEMICONDUCTOR APPARATUS**

**Masanobu Suenaga, Yokohama; Tetsuo Machii; Takahiro Sawano, both of Tokyo; Takehiko Kobayashi, Kawasaki; Tadao Dengo, Yokohama, and Tetsuzo Nakai, Kawaguchi, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan**

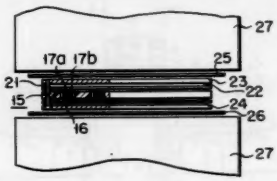
**Division of Ser. No. 59,853, June 25, 1970, Pat. No. 3,715,802. This application Sept. 5, 1972, Ser. No. 286,130**

**Claims priority, application Japan, Sept. 6, 1967, 42-56768; Sept. 27, 1967, 42-61666; Feb. 14, 1968, 43-8836**

**Int. Cl. B01j** *17/00*

**U.S. Cl. 29—588** **8 Claims**

A method for manufacturing a semiconductor apparatus comprising the steps of: taking two electrode substrate plate members and subjecting at least a part of said plate members, excepting that part which is to contact electrodes of a semiconductor element, to a surface treatment in order to increase the adhesion of adhesive applied thereto; arranging said two plate members substantially in parallel while positioning a plurality of laminated electrically insulating layer members between said plate members so that said layer members will be mounted to each other and to the plate members by adhesive preimpregnated in said insulating layer members, at least one of said plate and layer members having recesses formed therein for receiving semiconductor elements, and, meanwhile juxtapositioning semiconductor elements having at




least two electrodes with regard to said recesses so that said semiconductor element electrodes shall contact said non-treated parts of said plate members while being sealed between said plate and layer members in said recesses when said plate and layer members are pressed together, and, pressing while heating said plate and layer members together to form a unitary structure.

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**3,818,585**

**METHOD OF MANUFACTURING YOKE ASSEMBLIES**

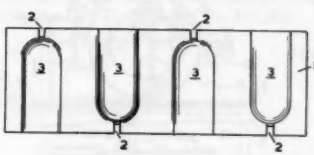
**Kenneth Preece, Solihull, England, assignor to Joseph Lucas (Electrical) Limited, Birmingham, England**

**Filed Dec. 29, 1972, Ser. No. 319,720**

**Claims priority, application Great Britain, Jan. 8, 1972, 943/72**

**Int. Cl. H02k** *15/14*

**U.S. Cl. 29—596** **8 Claims**




A method of manufacturing a yoke assembly for an electric motor and/or dynamo electric machine in which a series of spaced notches are formed in at least one of the edges, preferably in opposed edges, of a metal plate. Depressions are then formed separately in the metal plate so as to extend from each notch to the opposite edge of the plate. The metal plate is then rolled into a tube and a field winding is inserted into the tube around the poles which are defined by the depressions.

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**3,818,586**

**METHOD OF MAKING AN ASSEMBLY OF ALTERNATOR MAGNET BLOCKS WITH ENGINE FLYWHEEL**

**Joseph R. Harkness, Germantown; John D. Santi, West Allis, and Leo J. Lechtenberg, Elm Grove, all of Wis., assignors to Briggs & Stratton Corporation, Wauwatosa, Wis.**

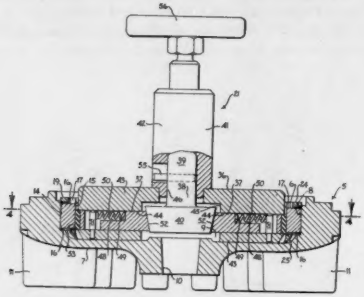
**Filed Sept. 16, 1971, Ser. No. 181,025**

**Int. Cl. H02k** *15/02*

**U.S. Cl. 29—598** **1 Claim**

To secure magnet blocks for an alternator in a cup-shaped flywheel, the inner surface of the flywheel side wall is coated with epoxy and an annular cage is axially inserted into the well in the flywheel. The cage cooperates with inner flywheel sur-

faces to define radially inwardly opening pockets, into each of which a block is inserted. A tool is disclosed for forcing the



blocks radially outwardly to desired positions in which they are held by a fixture while the epoxy is cured.

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**3,818,587**

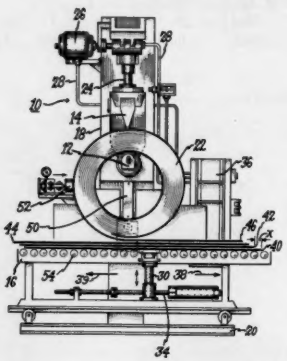
**METHOD FOR PROVIDING STAGGERED JOINT, SINGLE TURN, CUT CORE LAMINATIONS**

**Larry D. Williams, Taylorsville, N.C., assignor to General Electric Company, New York, N.Y.**

**Filed Nov. 13, 1972, Ser. No. 305,795**

**Int. Cl. H01f** *7/06*

**U.S. Cl. 29—606** **2 Claims**



A spirally wound roll of core steel is mounted on the arbor of a cutting and stacking machine. As the roll of core steel is cut by a moving blade, a table moves beneath the arbor at a constant speed catching each lamination as it is cut. The movement of the table as a function of the cutting speed of the blade provides for the offsetting of the ends of the cut laminations thereby providing staggered packets of laminations for later assembly into a staggered joint, single turn, cut core.

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**3,818,588**

**ELECTRICAL BRUSHES**

**James John Bates, Shrivenham, England, assignor to National Research Development Corporation, London, England**

**Filed Mar. 29, 1973, Ser. No. 346,022**

**Claims priority, application Great Britain, Mar. 30, 1972, 15085/72**

**Int. Cl. H01r** *9/00*

**U.S. Cl. 29—630 E** **9 Claims**

An electrical brush is constructed by moulding an aligned array of metal coated carbon fibres into a block. The block may be several times the required length and width of a brush, in which case it is then cut into strips corresponding to the desired length of a brush. The coating is then removed for part only of the lengths of the brushes to expose the individual carbon fibres at one end but leaving them consolidated for connection to a conductor at the other end. The strips are finally cut up to form individual brushes.

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**3,818,589**

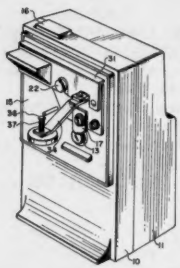
**CAN OPENER WITH REMOVABLE CUTTER ASSEMBLY**

**Edwin L. Oberto, Libertyville, Ill., assignor to Burgess Vibrocrafters, Inc., Grayslake, Ill.**

**Filed Nov. 6, 1972, Ser. No. 303,853**

**Int. Cl. B67b** *7/38*

**U.S. Cl. 30—4 R** **6 Claims**



The cutting blade of an electric can opener is affixed to a main plate which is pivotally mounted on a post extending forwardly from the front face of the can opener case. A latching plate has one end thereof pivotally connected to the main plate with a handle on the other end. The latching plate has a slot in the bottom which fits into an annular groove in the post so as to lock the two plates onto the post against axial movement. With the latching plate pivoted upwardly with respect to the main plate it is disengaged from the post so that the assembly of the plates and the cutter can be removed for washing.

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**3,818,590**

**TOOL FOR CUTTING CABLE SHEATHING**

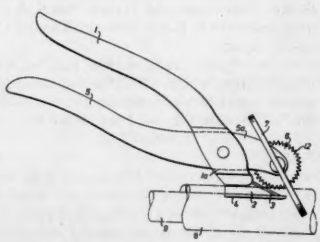
**Eugen Peter, Backnang, and Wolfgang Herold, Stuttgart, both of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt, Germany**

**Filed Nov. 27, 1972, Ser. No. 309,665**

**Claims priority, application Germany, Nov. 27, 1971, 2158888; Nov. 27, 1971, 7144708**

**Int. Cl. B26b** *27/00*

**U.S. Cl. 30—90.4** **3 Claims**



A cable sheathing cutting tool in the form of pincers has a blade portion attached on one of the head portions of the tool.

The front face of the blade acts as cutting edge and a slide shoe is attached along a longitudinal side of the blade. A wheel with teeth is disposed on a rotatable axle mounted in the second head portion of the tool. This axle is rotated in order to turn the wheel and move the cutting tool along the cable so that the blade can cut the sheathing.

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3,818,591

## TOOL FOR CUTTING CABLE SHEATHING

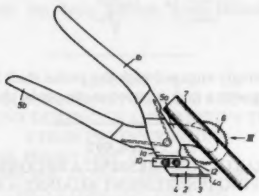
**Eugen Peter, Backnang, Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Germany**

**Filed Nov. 27, 1972, Ser. No. 309,666**

**Claims priority, application Germany, Sept. 9, 1972, 2244287; Sept. 9, 1972, 7233287**

**Int. Cl. B26b** *27/00*

**U.S. Cl. 30—90.4** **5 Claims**



A tool in the form of pincers for cutting cable sheathing is constructed with a blade portion attached on a first head portion of the tool and a rotatable wheel mounted on an axle attached to the second head portion of the tool. A slide shoe, which is attached along the bottom of the blade and travels between the cable core and the sheathing when the tool is being used, has a rounded prong on its front tip. The axle on which the wheel is mounted has a square shaped extension which can receive a socket wrench for rotating the axle. A tongue is provided on the first head portion for preventing the wheel from contacting the blade and thus damaging the blade. Additionally, marking means are provided for determining the length of sheathing to be cut.

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3,818,592

## KNIFE FOR PEELING OFF STICKERS AND THE LIKE

**Shohachi Himeno, Tokyo-to, Japan, assignor to Conde Kabushiki Kaisha, Tokyo-to, Japan**

**Filed May 7, 1973, Ser. No. 358,161**

**Claims priority, application Japan, May 20, 1972, 47-50025; May 22, 1972, 47-58904**

**Int. Cl. B26b** *3/06*

**U.S. Cl. 30—151** **4 Claims**

A knife has a flat reverse face and a beveled cutting face on the opposite side with a bevel dihedral angle of approximately 15° and a truncated extreme cutting edge in the form of a blunt leading edge, narrow regions respectively of the beveled cutting face and the reverse face immediately adjacent to and extending along the leading edge being further beveled with minute bevel angles each of approximately 2.5° relative to the beveled cutting face and the reverse face. When a knife of this shape is advanced with the leading edge in front into the thin adhesive layer of a sticker adhering to a fragile paper surface, it shaves the adhesive layer very close to and parallel to the paper surface without damaging it.

3,818,593

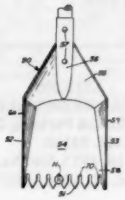
## BLADE FOR MATERIAL STRIPPING APPARATUS

**Wesley Joseph Oliverius, 1332 Fisherman Rd., Norfolk, Va. 23503**

**Continuation-in-part of Ser. No. 147,766, May 28, 1971, Pat. No. 3,726,565. This application Sept. 15, 1972, Ser. No. 289,723**

**Int. Cl. A47l** *13/02*

**U.S. Cl. 30—169** **5 Claims**



A blade for a material stripping machine including a movable carriage on which is located a motor for providing reciprocating motion to a blade member having a cutting edge for stripping material. The cutting edge of the blade member comprises a series of beveled teeth, and the body of the blade member has projecting upwardly therefrom at least one subsidiary cutting member having a cutting edge facing the cutting edge of the blade member for cutting through material stripped by the blade. The blade may also be provided in the form of a hand tool which may be used to remove shingles. Preferably a plurality of slots are provided in the recesses between the teeth to enable removal of shingle nails.

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3,818,594

## REMOVABLE DENTURE CONNECTION

**Arturo Gil-Castillo, San Jose de Ocoa, Dominican Republic**

**Continuation-in-part of Ser. No. 246,064, April 20, 1972. This application Oct. 27, 1972, Ser. No. 301,352**

**Int. Cl. A61c** *13/22*

**U.S. Cl. 32—5** **10 Claims**

A removable artificial tooth (or teeth) and gum prosthesis is attached to a pier tooth crown by means of a tapered tongue and groove connection. A spring in the tongue part of the connection is adapted to bear against depression in the wall of the groove or socket receiving the tongue part to form a dedent type connection. The spring includes a shank which extends away from the tongue portion in the direction of the gum into the gum prosthesis where it is embedded and at about a 45° angle relative to the face of the tongue. The inner part of the spring which engages the depression in the wall of the socket extends substantially in the direction of the gum and bears resiliently against the depression. Alternatively, a tube in the tongue part may receive the inner part of the spring which is resiliently restrained therein by a deformation proximate a gullet or slit near its end or within a curved portion in a curved tube. As a further alternative, the spring may have three primary parts, the first of which extends from the direction of the gum at a 45° angle in a channel within the tongue part to its face which contacts the socket wall, a second spring part extends approximately parallel to the face of the tongue part

away from the gum and engages a depression in the wall portion of the socket, and a third part extends at a 45° angle away from the gum and tongue face into a further channel of the tongue part. The channels for the latter spring are formed in part by backing plate which is, at least originally, in approximately the shape of a truncated triangle with the truncated portion adjacent and to the rear of the second spring part so that the second spring part can resiliently move towards the truncated part. Such plate is soltered in place and a portion is thereafter removed whereby it defines in part the channels for the first and third spring parts.

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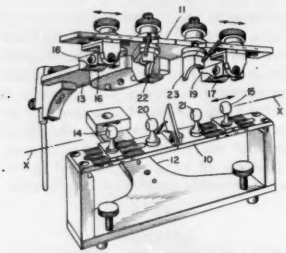
**3,818,595**

## DENTAL ARTICULATOR

**Charles E. Stuart, Rancho Los Portules, 297 Kimball Rd., P.O. Box 1298, Ventura, Calif. 93100**

**Filed Mar. 16, 1973, Ser. No. 341,960**
**Int. Cl. A61c** *11/00*
**U.S. Cl. 32—32** **5 Claims**



Washer-like plates having transverse ridges for supporting the condyle ball and fossa on the lower and upper bars of a dental articulator cooperate with transverse groove-like serrations on the bars themselves to maintain precise positionings of the condyle and fossa mounts in vertical alignment. The condyle ball and fossa which supports an eminentia guide cam receiving the ball simulate the pivoting action of a person's jaw and therefore precise alignment is necessary. In addition, adjustments of the fossa can be effected without disturbing the horizontal position because of the cooperating ridges and groove-like serrations. In addition, the eminentia itself includes an extended lip portion of plastic material engaging the roof of the fossa to serve as a bearing for the condyle ball. This surface may be hollowed out or built up to provide very fine adjustments in the action of simulating the human joint of the jaw.

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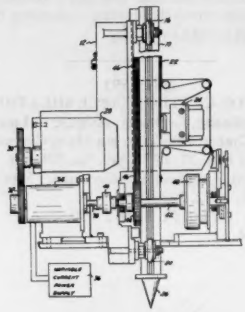
**3,818,596**

## COUNTERBALANCE FOR A VERTICALLY SUPPORTED PROBE SHAFT

**James M. Stemple, and Paul E. Allen, both of Springfield, Ohio, assignors to The Bendix Corporation, Dayton, Ohio**

**Filed Mar. 29, 1973, Ser. No. 345,913**
**Int. Cl. G01b** *5/20;* **F16m** *11/04*
**U.S. Cl. 33—1 M** **2 Claims**

A counterbalance arrangement is disclosed for a vertically supported coordinate measuring machine probe shaft. This arrangement consists of an electric motor coupled to a variable torque magnetic particle clutch, which clutch is capable of being set to a torque transmission level corresponding to the weight of the probe shaft. The output of the magnetic particle



clutch is drivingly engaged with the probe shaft by means of a gear meshing with a rack secured to the probe shaft.

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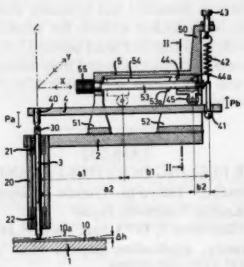
**3,818,597**

## APPARATUS FOR PRESSING A RECORDING OR ENGRAVING INSTRUMENT AGAINST A SURFACE MOVING RELATIVE THERETO

**Arthur Schmied, Wallisellen, Switzerland, assignor to Contares AG, Zurich, Switzerland**

**Filed Aug. 24, 1972, Ser. No. 283,522**
**Claims priority, application Switzerland, Oct. 11, 1971, 14830/71**
**Int. Cl. B43l** *13/00*
**U.S. Cl. 33—18 R** **4 Claims**



An apparatus for pressing a recording- or engraving instrument, typically a writing or engraving stylus, against a surface moving relative thereto wherein the pivot mounting arrangement of a double-arm lever serving for transmitting the force of an elastic pressure generator means to the recording or engraving instrument is adjustable in the lengthwise direction of the lever.

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**3,818,598**

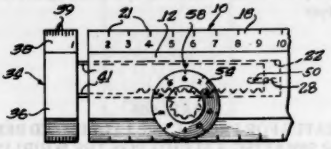
## MEASURING DEVICE

**Kent M. Hershire, Fort Madison, Iowa, assignor to E-Z Read Metric Rule, Inc., Houston, Tex.**

**Filed Nov. 3, 1972, Ser. No. 303,617**
**Int. Cl. G01b** *3/08*
**U.S. Cl. 33—161** **8 Claims**

A rule for measuring meters or other units and sub-divisions thereof, the rule comprising a body section having indicia which defines units of measure, there being provided at one end of the body section a longitudinally movable head section

having indicia which defines sub-divisions of one unit of measure. Movement of the head section is accomplished by means of a motion translating mechanism which is actuated upon



manual rotation of a dial, or the like, the dial having readily viewed indicia which indicates the distance the head section is projected from the body section upon actuation of the mechanism.

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**3,818,599**

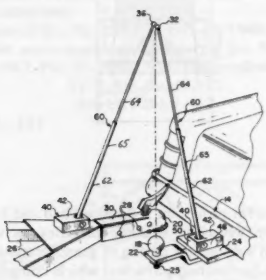
**VISUAL GUIDE MEANS FOR BALL AND SOCKET ALIGNMENT DURING AN AUTOMOTIVE TRAILER COUPLING OPERATION**

**Robert J. Tague, Wonder Lake, Ill. 60097**

**Filed Sept. 25, 1972, Ser. No. 291,609**

**Int. Cl. G01c** *5/00*; **B60d** *1/06*

**U.S. Cl. 33—264** **2 Claims**



A sighting device consisting of two similar components which, when operatively applied, respectively, to the socket-carrying hitch arm of a trailer or other vehicle to be towed and the ball-carrying hitch arm of an automobile or other towing vehicle present sighting indicia or elements which are disposed at the same level above the ground and establish a plumb line which passes through the centers of the socket and ball of the coupling between the trailer and the automobile so that when a driver maneuvers the automobile in such a manner that the sighting elements contact each other, the socket and ball are in vertical alignment for hook-up or coupling purposes.

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**3,818,600**

**HAIR DRYER WITH HOOD**

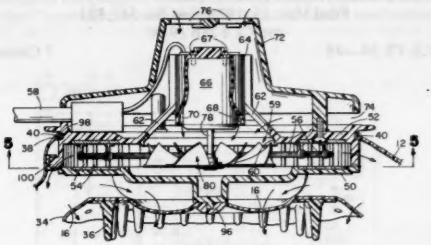
**Ernest John Fischer, Chicago, Ill., assignor to The Gillette Company, Boston, Mass.**

**Filed Apr. 23, 1973, Ser. No. 353,470**

**Int. Cl. A45d** *20/24*

**U.S. Cl. 34—99** **8 Claims**

Portable hair dryer of the type having a hood with a blower and heater mounted on it, the blower having a centrifugal fan with radially extending blades having convexly curved leading faces, each blade being secured along its trailing edge to an imperforate disc, the fan being mounted at the exit end of a



duct with the tips of the leading edges of the blades within the duct and the remainder of the blades outside the duct.

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**3,818,601**

**REDUCING DEFECTS IN KILN DRYING LUMBER**

**Glenn Adair Cooper, Carterville, and Stanley H. Barham, Johnston City, both of Ill., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.**

**Filed Sept. 7, 1973, Ser. No. 395,196**

**Int. Cl. F26b** *7/00*

**U.S. Cl. 34—13.4** **6 Claims**

A method of pretreating lumber to be kiln-dried wherein the lumber is first immersed in a cold aqueous solution containing black walnut pellicle extract, rich in hydrolyzable tannins, until the wood has absorbed part of the extract by diffusion. The lumber is subsequently frozen prior to entering the kiln. The presoaking treatment, when combined with prefreezing, has a synergistic effect that reduces shrinkage and collapse of the lumber while also allowing an accelerated drying schedule in the kiln.

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**3,818,602**

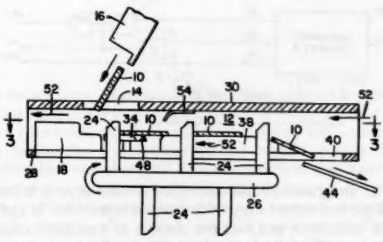
**DRYING APPARATUS**

**William R. Eppes, Cary, N.C., assignor to Corning Glass Works, Corning, N.Y.**

**Filed May 29, 1973, Ser. No. 364,867**

**Int. Cl. F26b** *5/14*

**U.S. Cl. 34—14** **10 Claims**



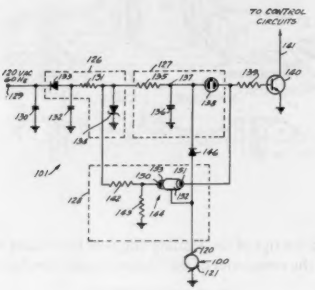
An apparatus and method for continuously drying processed microscope slides wherein excess moisture is first removed from both sides of the slide and thereafter the slide is totally dried by removing the remaining moisture.

3,818,603

## DRY SENSOR CIRCUIT WITH STATIC DISCRIMINATOR FOR DRYER

Roque D. Marcade, Stevensville, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Mar. 15, 1973, Ser. No. 341,521
Int. Cl. F26b *19/00*
U.S. Cl. 34—45 7 Claims



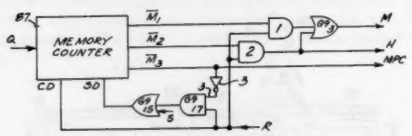

A dry sensor circuit employs a static discriminator to prevent positive electrostatic charges carried by clothes being dried from causing erroneous signals to the dryer control circuit. The static discriminator includes a neon tube having a control electrode in the form of a metal shield which surrounds the glass envelope of the tube. The voltage level of the metal shield affects the level of the breakdown voltage of the neon tube. The shield is connected to an electrode of a dryness sensor so that positive electrostatic charges cause the shield voltage level to become positive with respect to both the cathode and the anode of the tube to lower the breakdown voltage. When the breakdown voltage decreases to a level below that impressed thereon by a voltage divider network, the neon tube fires to indicate that the static charge does not represent wet fabric.

3,818,604

## TERMINATION LOGIC AND OUTPUT SUPPRESSION FOR INTEGRATED CIRCUIT DRYER CONTROL

Carl R. Offutt, St. Joseph; Donald Edward Janke, Benton Harbor, and Roque Denis Marcade, Stevensville, all of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Sept. 25, 1973, Ser. No. 400,700
Int. Cl. F26b *11/04*; H03k *17/00*
U.S. Cl. 34—45 12 Claims



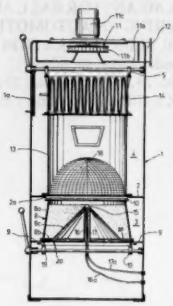

In an integrated circuit controlled clothes dryer a termination logic and output suppression circuit is provided as a safety device to control and lock the outputs of a memory counter which are effective to control the motor, heater and master power circuits of the dryer, so that dryer operation is positively terminated at the end of a drying cycle and the dryer is thus prevented from reentering an operational state at some point in a drying cycle in response to instability of the memory counter when power is removed. The dryer also includes a device for detecting improper connection to the electrical supply, such as an ungrounded state, and this device signals the termination logic in response to such a condition to turn off the dryer. The output suppression circuit prevents operation of the dryer motor and heater until power has been applied for a predetermined interval upon starting and restarting of the dryer.

3,818,605

## APPARATUS FOR PRODUCING A FLUIDIZED BED AND FOR SPRAYING A FLUID UPON THE WHIRLING PARTICLES

Werner Glatt, 7859 Haltingen/Baden, Germany

Filed June 4, 1971, Ser. No. 149,913
Claims priority, application Switzerland, June 16, 1970, 9082/70
Int. Cl. F26b *17/10*
U.S. Cl. 34—57 A 5 Claims



An apparatus for producing a fluidized bed and for spraying a fluid medium upon the whirling particles, as well as for moistening and subsequent drying of granular material or the like as well as for coating particles, which comprises a container for the material to be treated. The container is constructed so that it is upwardly and inwardly inclined, in other words tapers towards the top thereof and possesses an apertured floor having mounted thereat a central cone-like projection or elevation. Atomizer nozzles for the fluid medium are provided at the apex of the cone-like projection, and a vertically extending chute or shaft merges with the top of the container. According to an important aspect of this development a substantially non-deformable yet elastic dome-shaped net which confines the fluidized bed is arranged over the container.

3,818,606

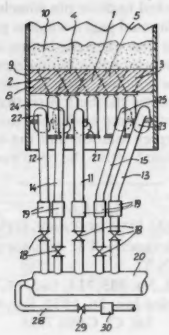
## GAS SUPPLY APPARATUS FOR FLUIDIZATION TREATMENT REACTOR

Robert Ph. A. Marcellini, Freyming-Merlebach, France, assignor to Charbonnages De France, Paris, France

Filed Feb. 6, 1973, Ser. No. 330,054
Claims priority, application France, Feb. 16, 1972, 72.05219
Int. Cl. F26b *17/00*
U.S. Cl. 34—57 A 5 Claims

In a fluidization treatment reactor, the base of the treatment chamber is a grid perforated by cavities, and the bottoms of

the cavities are respectively connected by syphons to fluidizing agent supply ducts which are connected to a common



supply manifold. The syphons provide traps to collect any particulate material which falls through the cavities if the fluidization agent supply pressure falls.

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**3,818,607**

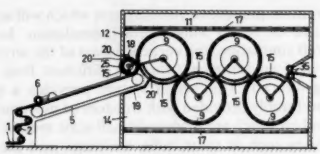
**PROCESS AND APPARATUS FOR THE TREATMENT OF MATERIAL LENGTHS**

**Heinz Fleissner, Frankfurt, Germany, assignor to Vepa AG, Basel, Switzerland**

**Division of Ser. No. 799,478, Feb. 14, 1969, Pat. No. 3,605,280, and a continuation-in-part of Ser. No. 654,728, July 20, 1967, Pat. No. 3,503,134. This application May 19, 1970, Ser. No. 48,702**

**Int. Cl. F26b *11/02***

**U.S. Cl. 34—115** **13 Claims**



The present disclosure is directed to a process and apparatus for the treatment of materials which comprises a heat-insulated treatment chamber, a plurality of sieve drum means subjected to a suction draft rotatably disposed within said treatment chamber, fan means for producing a suction draft and for circulating the treatment medium in said treatment chamber, heating means provided in the circulation zone of the treatment medium, tentering means containing tensioning chains at least partially disposed outside of the treatment chamber as inlet means, said tentering means cooperating with the sieve drum means for the effective conveyance of the material being treated to said sieve drum means, and outlet means for removing the material being treated from the treatment chamber.

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**3,818,608**

**METHOD FOR PRACTICING SHORTHAND**

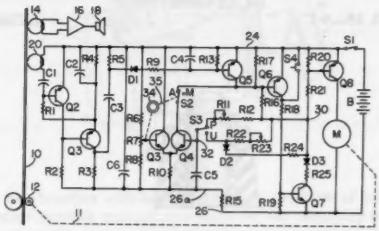
**John M. Bell, 3583 Monterosa Dr., Altadena, Calif. 91001**

**Filed Aug. 31, 1972, Ser. No. 285,505**

**Int. Cl. G09b *11/08***

**U.S. Cl. 35—8 A** **1 Claim**

A magnetic tape playing machine is equipped with electronic means for stopping the tape in response to individual stop signals prerecorded on the tape, and for then restarting the tape after an electronically metered, continuously variable pause time. That time may depend alternatively upon a single manually adjustable control, or upon both the manual control and upon the duration of the preceding "play" time. A manual "start" control can override the automatic restart mechanism,



providing individually controllable pause times when the automatic control mechanism is switched off. The invention thus permits a student of shorthand to play "dictation" from a single tape at an effective speed that is continuously variable under his own control from the slowest speeds required by a beginner up to full normal dictation speed.

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**3,818,609**

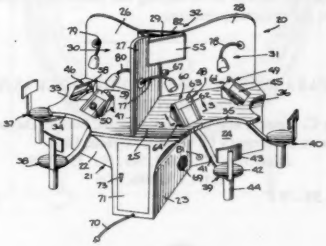
**DEVICE FOR PAIRED LEARNING AND PROCESS THEREOF**

**Myron Woolman, 4828 16th St. N.W., New York, N.Y. 20011**

**Continuation of Ser. No. 41,167, May 28, 1970, abandoned. This application Sept. 18, 1972, Ser. No. 289,587**

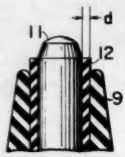
**Int. Cl. G09b *7/00***

**U.S. Cl. 35—8 R** **61 Claims**



A device to facilitate mutually interactive paired learning by at least one learner pair is provided and is comprised of a work space to provide for at least one learner pair and a presentation means for transmitting to the learner pair a cross-synchronized stimulus field. The stimulus field presented consists of programmed and sequenced intelligence elements consisting of instructional information, response designation signals, interrogatory stimuli, and programmatically correct responses arranged in a manner for each of the learners of said learner pair to respond in a controlled fashion to the interrogatory stimuli according to information received from the response signals of the other pair member and to then individually and mutually compare the programmatically correct responses with the individual and joint responses given by the learner pair.

3,818,610
STUDY AID
Yoshiki Baba, Yokohama, and Yoshikazu Ayai, Kamakura, both of Japan, assignors to Kabushiki Kaisha International Library, Tokyo, Japan
Filed Nov. 22, 1971, Ser. No. 200,876
Claims priority, application Japan, Nov. 24, 1970, 45-102677; Nov. 24, 1970, 45-102678
Int. Cl. G09b 7/00
U.S. Cl. 35—9 C 6 Claims




A study aid comprising two independent members in combination. One of these two members comprises a printed sheet having at least one printed column of questions and a column for a plurality of selectable answers and markings adjacent the answers. These markings may be either contiguous or independent. One of these markings which represents the correct answer is made with an electro-conductive element, and the other markings representing erroneous answers are made with an electrically insulating material. These two kinds of markings are printed on a sheet material in a manner so as to be visually indistinguishable from each other. The other member is an answer-spotting electric instrument of the pen type and having at one of its ends two spaced contact members and a signal generating circuit connected to these contact members and a signal indicator provided on the other end and connected to the circuit.

By the use of this paired study aid, the user is able to recognize immediately whether his answer is correct from the signal generated by the signal indicator without having to examine the end pages of a study reference book, as in the prior art, to find a correct answer from among the numerous answers provided for the various questions.

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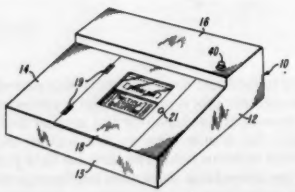
3,818,611
APPARATUS FOR CONDUCTING PROGRAMMED PSYCHOTHERAPY
Gregory G. Young, and Melvin C. Eifert, both of Dayton, Ohio, assignors to Gregory G. Young, Dayton, Ohio
Filed May 10, 1973, Ser. No. 359,119
Int. Cl. G09b 3/06
U.S. Cl. 35—9 F 8 Claims




A paper web or strip having marginal feed holes, is printed at longitudinally spaced intervals with a prescribed psychotherapy program consisting of a series of selected problems. Each problem on the strip is followed by multiple choice alternative solutions which are followed on the strip by the correct solution and a space for the patient's comment. The strip is automatically advanced in alternating increments of different lengths by depressing a push button which actuates a motor connected to drive pin wheels engaging the feed holes. The strip is directed past a window partially closed by a transparent panel so that when the button is first depressed, a problem and the corresponding multiple choice solutions are presented within the window. After the patient selects a solution, he again depresses the button so that the problem and multiple choice solutions are positioned under the transparent panel while the correct solution and the space for a written comment are positioned within the open part of the window.

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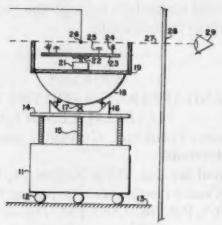
3,818,612
VISUAL SYSTEM FOR ROTARY-WING AIRCRAFT
Walter E. Myles, Alexandria, Va., assignor to The Singer Company, New York, N.Y.
Continuation of Ser. No. 885,714, Dec. 17, 1969, abandoned.
This application Jan. 26, 1972, Ser. No. 220,773
Int. Cl. G09b 7/08
U.S. Cl. 35—12 N 9 Claims



This invention provides a visual system which will satisfy the requirements of rotary-wing aircraft simulation. In rotary-wing aircraft simulation, the vertical ascent of the aircraft provides a visual environment which is different from that of fixed-wing aircraft. This visual system provides a platform which is preferably provided with freedom of movement in six degrees and on which are mounted small scale models of vertical structures such as trees, hills, buildings, and the like. A point light source provides back illumination with the silhouettes of the models projected onto the back of a rear projection screen. The eye of the observer is at the ground level horizon, and the platform is supported to move vertically to simulate the ascent and descent of the aircraft, and to move about the horizon line to provide visual simulation of the aircraft movements.

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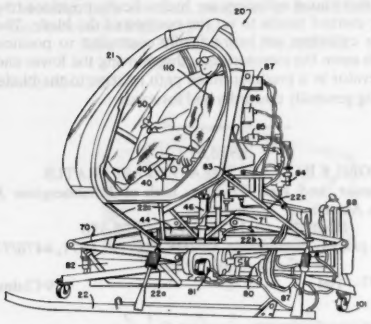
3,818,613
HELICOPTER HOVER SIMULATOR
Maurice F. Julian, 503 S.E. 27 Ave., Mineral Wells, Tex. 76067, and James A. Tork, P.O. Box 462, Millsap, Tex. 76066
Filed July 18, 1972, Ser. No. 273,006
Int. Cl. G09b 9/08
U.S. Cl. 35—12 K 12 Claims

A helicopter hover simulator comprising a helicopter cabin with conventional flight controls comprising a collective pitch stick (ascent and descent), a cyclic pitch stick (attitude), antitorque pedals (rotational movement) and a throttle (rate of operation) mounted on a tiltable base member, which in turn is mounted on a ball and socket universal joint, which in turn is mounted on the upper base member of a vertically extendible pantograph assembly which includes a vertical lift hydraulic cylinder for raising and lowering the cabin. The helicopter

cabin is tiltably moved in a fore and aft direction by a fore and aft hydraulic cylinder actuating the tiltable base member, and



it is tilted laterally by a lateral hydraulic cylinder actuating the tiltable base member. The pantograph assembly is rotatably supported on a central shaft resting on the ground.

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**3,818,614**

**APPARATUS FOR DEMONSTRATING THE CRITICAL TEMPERATURE OF A FLUID**

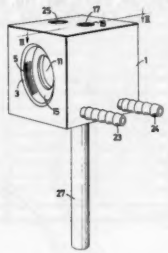
**Engelbert Meurer, Bensberg-Moitzfeld, Germany, assignor to Leybold-Heraeus-Verwaltung GmbH, Cologne Bayental, Germany**

**Filed Mar. 30, 1972, Ser. No. 239,600**

**Claims priority, application Germany, Mar. 30, 1971, 2115360**

**Int. Cl. G09b *23/12***

**U.S. Cl. 35—19 R** **9 Claims**



An apparatus for demonstrating the critical temperature of a medium having a heatable pressure chamber for the medium in the interior of a metal housing and this chamber can be viewed through oppositely disposed windows in the housing. The windows have flat panes which are maintained in pressure-tight relationship with respect to the housing and in parallel planes with respect to one another.

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**3,818,615**

**EDUCATIONAL PUZZLE WITH PAPER WRITING SURFACE**

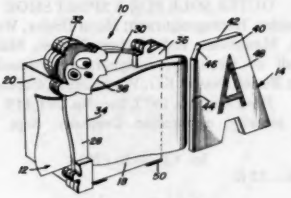
**David J. Jimenez, P.O. Box 3458 Station "A", El Paso, Tex. 79923**

**Continuation-in-part of Ser. No. 288,339, Sept. 12, 1972, Pat. No. 3,745,675. This application July 16, 1973, Ser. No. 379,244**

**Int. Cl. G09b *11/04***

**U.S. Cl. 35—37** **3 Claims**

An educational puzzle for teaching recognition of letter and number symbols and providing a paper writing surface by which a child may form letters, number symbols and the like. The puzzle includes a box-like device provided with a mounting and writing surface on the front thereof which is framed on two sides by a raised, three-dimensional figure of a clown or



the like together with inserts shaped in the form of letter or number symbols and adapted to fit on the mounting surface together with a paper roll dispensing arrangement or paper insert also associated with the mounting surface by which a child may write.

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**3,818,616**

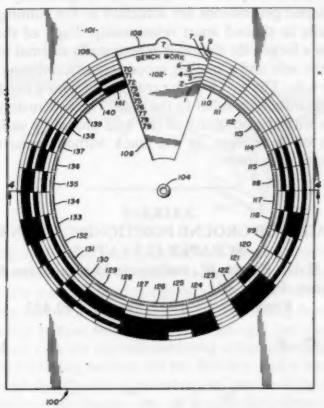
**METHOD AND DEVICE FOR CAREER SELECTION**

**Gordon Weber, 153 Petrie Rd., Atwater, Ohio 44201**

**Filed Feb. 23, 1973, Ser. No. 335,031**

**Int. Cl. G09b *1/22***

**U.S. Cl. 35—74** **7 Claims**



Disclosed is a device and method of operation for the simplified ascertainment of the characteristics of various careers contained in a reference manual. The device consists of a front plate having a window, a rear plate, and a circular disc rotatably fastened therebetween. An occupational field of general interest or special aptitude is selected from the front plate. One or more of nine major occupational categories may be available within that occupational field and one may be selected by rotating the circular disc until the category appears in the window of the front plate. A numbered occupational division and first accompanying numeral is then selected from the circular disc. The first accompanying numeral is then located in the reference manual wherein all occupations have been arranged in a numerical sequence. A specific occupational title and second accompanying numeral is then selected from the reference manual. The second numeral may then be translated into characteristics of the selected occupation from a table on the rear plate of the

device. Alternatively, more desirable characteristics may be translated into a numeral from the table and a new occupational title obtained from the reference manual.

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**3,818,617**

## OUTER SOLE FOR A SPORT SHOE

**Rudolf Dassler, Herzogenqurach; Horst Dreier, Worms; Erich Strickle, Mannheim, and Norbert Muller, Mainz-Gonsenheim, all of Germany, assignors to Puma-Sportschuhfabriken Rudolf Dessler KG, Wurzburger, Germany**

**Filed Aug. 16, 1972, Ser. No. 281,119**

**Claims priority, application Germany, Sept. 15, 1971, 2145982**

**Int. Cl. A43b** *13/04*

**U.S. Cl. 36—32 R** **9 Claims**

There is disclosed a track sport shoe with an outer sole specifically designed for use on tracks covered with a layer of thermoplastic synthetic material. The outer sole is made of a thermoplastic synthetic material having an elastic modulus of at least 10,000 kp/cm². A plurality of generally wedge-or tooth-shaped protrusions are attached to the running surface of the sole in spaced apart relationship. Each of the protrusions has a large side disposed substantially normal to the surface of the sole and a smaller secondary side defining an angle with the sole. The tip of each protrusion forms a small surface area substantially parallel to the sole. The protrusions in conjunction with the elasticity of the sole provide a safe grip for the foot of an athlete on the track without penetrating or cutting into the same.

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**3,818,618**

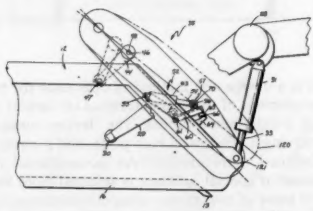
## LINKAGE FOR GROUND POSITIONING OF AN EARTH SCRAPER ELEVATOR

**John H. Hyler, Peoria, Ill., assignor to Westinghouse Air Brake Company, Peoria, Ill.**

**Filed Sept. 19, 1972, Ser. No. 290,422**

**Int. Cl. B60p** *1/36*

**U.S. Cl. 37—8** **12 Claims**



An elevator located at the open end of a scraper bowl is rotatable upon a pair of links connecting the upper end of the elevator sidewalls to the bowl sidewalls. A pair of cams resiliently mounted on the bowl sidewalls to extend forwardly and upwardly support one end of a pair of extensible hydraulic cylinders pivotally connected to the bowl sidewalls. The cylinders include rollers as cam followers linked to the extensible end of the cylinders and rotatable upon the supportive cam surfaces. A pair of bowl hoist hydraulic cylinders pivotally connect a draft frame to the bowl near the lower open end of the bowl where a transverse scraper blade is secured. In operation, the bowl hoist cylinders are hydraulically positioned by hydraulic control means to set the position of the blade. The extensible cylinders are hydraulically controlled to position the rollers upon the cam surfaces, thus moving the lower end of the elevator in a predetermined path relative to the blade, i.e., sloping generally upwardly and forwardly.

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**3,818,619**

## MOBILE BALLAST TREATING APPARATUS

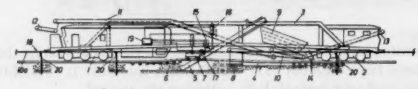
**Franz Plasser, and Josef Theurer, both of Johannesgasse 3, Vienna, Austria**

**Filed May 10, 1972, Ser. No. 252,350**

**Claims priority, application Austria, May 24, 1971, 4478/71**

**Int. Cl. E02f** *5/22*

**U.S. Cl. 37—104** **9 Claims**



A mobile ballast cleaning machine comprises means for lifting and holding the track, vertically adjustable means for removing ballast from the bed to a desired depth, and means associated with the ballast removing means for continuously surveying the depth of the ballast removal and for controlling the same.

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**3,818,620**

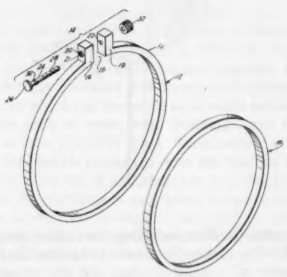
## EMBROIDERY HOOP

**Allen I. Field, 147 Valley Stream Rd., Larchmont, N.Y. 10538, and Sidney P. Field, 226 Beach 134th St., Belle Harbor, N.Y.**

**Filed Sept. 28, 1973, Ser. No. 401,631**

**Int. Cl. D05c** *1/04*

**U.S. Cl. 38—102.2** **4 Claims**

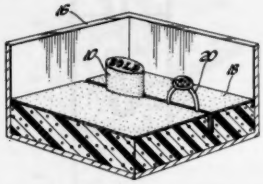


An embroidery hoop includes a plastic inner ring element, a plastic outer ring element having a body with a gap therein, and means for adjusting the diameter of the outer ring element. The adjusting means takes the form of first and second parts, each of which is more massive than the body of the outer ring element. One of the parts is integral with the portion of the body situated on each side of the gap. The parts are provided with registering lateral apertures and are adjustably positionable relative to each other by a screw and nut assembly. The screw is received in the apertures of both parts and has a head portion located on the exterior side of the first part. A threaded portion adopted to engage the nut is situated on the exterior side of the second part. The screw is provided with a knurled portion fitting tightly within the interior of the aperture of the first part and effective to prevent rotation of the screw relative to the parts.

## 3,818,621
## RING PLUG

**Earl F. Hogue, Dearborn, and Richard P. Katch, Redford Township, both of Mich., assignors to Romel Distributors, Inc., Dearborn Heights, Mich.**

**Filed Nov. 30, 1972, Ser. No. 310,745**
**Int. Cl. A44c** *3/00*
**U.S. Cl. 40—2 R** **4 Claims**

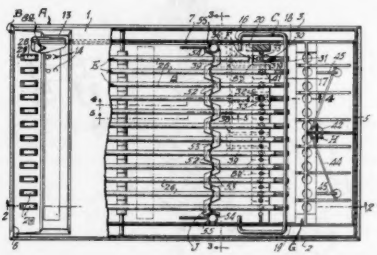


A ring plug for use in combination with a slotted finger ring display case including a solid, molded plastic body having opposite inclined end surfaces bearing indicia representing the sales status of the ring temporarily represented in the display case by the ring plug.

## 3,818,622
## KEY CONTROLLED CARD SELECTOR WITH MEANS TO PREVENT SIMULTANEOUS OPERATION OF ADJACENT KEYS

**Richard E. Beger, Point Pleasant, N.J., assignor to The Bates Manufacturing Company, Orange, N.J.**

**Filed Mar. 26, 1973, Ser. No. 344,948**
**Int. Cl. B42f** *21/00*
**U.S. Cl. 40—104.01** **5 Claims**



Means controlled by a desired key is provided in a key operated device to prevent unintentional operation of the keys closely adjacent and at opposite sides of said desired key when the latter is manually operated, and means being especially adapted for use with an index card selector wherein each card is selected by a key and pulled into view with some of the other cards below it while other cards above the selected card are held against movement, thereby to ensure proper selection of the desired card with a minimum of possibility of tearing the cards.

## 3,818,623
## COMPOSITE SERVICE PLATE

**Ralph P. Wilton, Wrightsville, and John J. Fitzpatrick, Hellam, both of Pa., assignors to Wilton Brass Company, Columbia, Pa.**

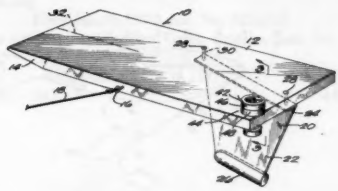
**Continuation-in-part of Ser. No. 38,955, May 20, 1970, abandoned. This application Apr. 21, 1972, Ser. No. 246,398**
**Int. Cl. G09f** *23/08*; **A47g** *19/02*
**U.S. Cl. 40—324** **5 Claims**

A composite type service plate affording a wide range of ornamental and aesthetic effects by providing a rim member molded or cast from one type of material such as metal, and provided with a central seat to receive a single or composite inset member preferably made from a different or contrasting type of material, such as ceramic, the inset being firmly connected to the seat for permanent union therewith and designed to permit stacking without contacting the inset members.

## 3,818,624
## TROLLING DEVICE

**William M. Duffy, W152 N7124 Westwood Dr., Menomonee Falls, Wis. 53051**

**Filed Jan. 12, 1973, Ser. No. 323,014**
**Int. Cl. A01k** *91/00*
**U.S. Cl. 43—43.13** **3 Claims**



A trolling device for fishing includes a planing board with a weighted keel structure which is inclined at an angle with respect to the center line of the planing board to maintain the board to the side of the towing vessel. The trolling device also includes a trip release for detachably holding a fish line to the planing board with the trip release being adjustable to increase or decrease clamping tension on the fish line and a button for separation of the clamping members to enable easy manual engagement and disengagement of the fish line from the trip release.

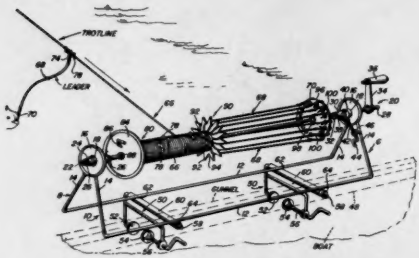
## 3,818,625
## TROTLINE REEL

**Thomas B. Shults, 1600 Hamilton, Pampa, Tex. 79065**

**Filed Jan. 23, 1973, Ser. No. 325,991**
**Int. Cl. A01k** *97/06*
**U.S. Cl. 43—27.4** **7 Claims**

Supporting and handling means for a trotline of a type provided at longitudinally spaced places with swivelly mounted leader-type staging lines. It comprises a portable stand, a substantially horizontal shaft mounted for controllable rotation on the stand and a reel or spool mounted on and for rotation with the shaft. The reel embodies a hub on which the trotline is normally wound and from which it can be progressively payed out when being used. The reel embodies a first head fixed at one end of the hub and a second head located at the other end of the hub. The second head has individual leader dividing and separating means. In addition, leader distributing

and anchoring means is operatively mounted on the shaft spaced from but cooperatively aligned with the dividing and




separating means. The anchoring means serves to systematically store the fishhooks on the individual leaders and assists in achieving the desired tangle-free handling of leaders.

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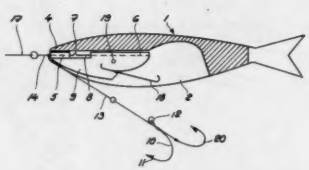
**3,818,626**
**FISH DECOY**

**Emil Peippo, Alousneuvos Katipuk, 70411, Harjavalta, Finland**

**Filed July 2, 1973, Ser. No. 375,443**
**Claims priority, application Finland, July 12, 1972, 1978/72**
**Int. Cl. A01k** *85/02*
**U.S. Cl. 43—42.04** **6 Claims**



This invention relates to a fish decoy or lure having a body containing an elongated recess open to at least one side of the body and a detachable plate member in the recess comprising a longitudinal bore extending from the front part of the plate member into the recess. A setting pin attached to a fish line extends through the bore for slidable movement therein so that the rear end of the setting pin may protrude into the recess. A fish hook is provided with a loop adapted to fit over the rear end of the setting pin when protruding into the recess. A spring member having one end attached to the plate member and the other end urged against the hook is adapted to eject the hook out of the body when the setting pin is released from the hook loop. A spring wire is attached with one end of the hook and with the other end located at the forward end of the plate member.

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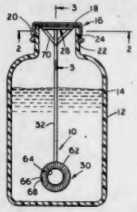
**3,818,627**
**BUBBLE FILM HOLDING WAND**

**Steven Lebensfeld, 222 Thomas St., Newark, N.J. 07014**

**Filed Mar. 19, 1973, Ser. No. 342,835**
**Int. Cl. A63h** *33/28*
**U.S. Cl. 46—7** **7 Claims**

A bubble film holding wand for use with a bottle containing bubble film solution is manufactured as an integral molded unit and includes a seal portion and a bubble film portion. The seal portion seals a bottle cap preventing leakage of the bubble film solution. Projections extending from the seal portion bear against the inside of the bottle cap retaining the seal in



the bottle cap which is grasped by the user as a handle for the wand.

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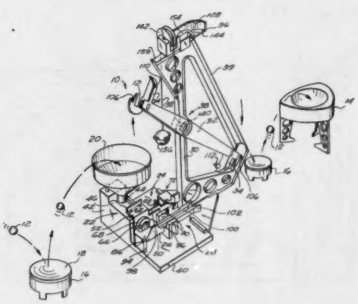
**3,818,628**
**OBJECT-LIFTING DEVICE INCLUDING MEANS FOR METERING OBJECTS FROM STORAGE STATION TO PICKUP STATION**

**Burt Ensmann, Flushing, and Henry Hinz, Huntington, L. I., both of N.Y., assignors to Ideal Toy Corporation, Hollis, N.Y.**

**Filed Nov. 1, 1972, Ser. No. 302,718**
**Int. Cl. A63h** *29/08*
**U.S. Cl. 46—42** **27 Claims**

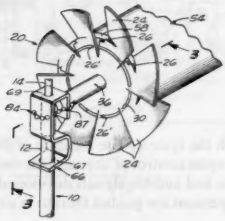


A toy for separately and automatically raising individual toy balls from a first level to a higher level in order to produce kinetic energy in the, which includes a ball storage station and a ball pickup station, with means provided adjacent the pickup station for lifting the ball from the pickup station to a higher position in the device wherein it is discharged along an inclined ramp to produce kinetic energy therein. One or more individual balls are supplied to the storage station and a metering device is provided between the storage station and the pickup station for selectively permitting passage of individual balls from the storage station in response to the presence of a ball at the storage station and to the presence of the lifting means at the pickup station. Drums may be placed near the storage station and ramp exit so that balls may be fed to the former and from the latter by rebounding off the drums. A game may be played by players attempting to cause a ball to complete an entire path of travel. The lifting means may be an arm rotating in a vertical plane and driven by a suspended weight.

## 3,818,629
## NOVELTY AERIAL SPINNER DEVICE

Jack H. Davidson, 16058 Mariner Dr., Huntington Beach, Calif. 92647

Filed Sept. 25, 1972, Ser. No. 291,578
Int. Cl. A63h *33/40*
U.S. Cl. 46—53 8 Claims

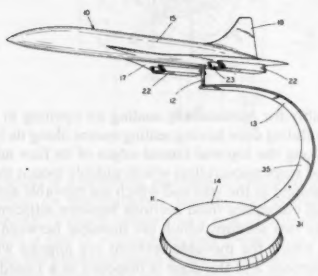


A novelty spinner device attachable to a vehicle radio aerial. A rotary wind-driven impeller wheel is secured on the end of the stem with bracket means adapted to be received and held on a vehicle radio aerial. A pull tab beverage container which can carry advertising and promotion material is secured to the center of the impeller wheel to rotate with it and to be movable circularly around the aerial.

## 3,818,630
## MODEL AND SUPPORT STAND THEREFOR

Dale S. May, 141 N. Dee Rd., Park Ridge, Ill. 60068

Filed June 12, 1972, Ser. No. 261,789
Int. Cl. A63h *13/12*
U.S. Cl. 46—131 4 Claims

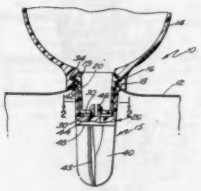


A model airplane is provided with an upwardly extending recess in the rearward portion of the fuselage, and the recess terminates in a point-receiving conical depression. The recess is generally aligned longitudinally with the center of gravity of the model, and the conical depression is located above or approximately at the center of gravity. Adjustable weights may be carried in the wings or other parts of the model to permit the center of gravity of the airplane to be varied longitudinally so that the center of gravity can be precisely positioned relative to the recess. The support stand includes a base and a flexible, resilient, curved spring metal band or sheet which is secured to the base and extends arcuately upwardly therefrom. An elongated support needle is secured to the upper end of the band, and the needle extends into the recess in the model and terminates in a point which is received by the conical depression. The model is thereby supported on the point of the needle, and the flexible, resilient band and the point support permit the model to undergo a variety of movements under the influence of air drafts or other forces to provide realistic simulation of the movements of a real airplane.

## 3,818,631
## TOY ARTICLE AND NECK CONNECTOR THEREFOR

Carl E. Cederholm, Providence, R.I., assignor to Hasbro Industries, Inc., Pawtucket, R.I.

Filed Dec. 18, 1972, Ser. No. 308,134
Int. Cl. A63h *3/46*
U.S. Cl. 46—161 11 Claims

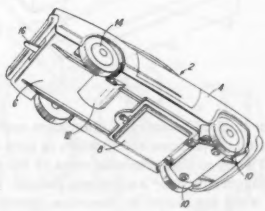


A toy figure and neck connector therefor including a body formed of a flexible material having a filler material disposed therein, the neck connector being secured to the flexible material of the body and providing for convenient mounting of a head thereon; the neck connector further including interfitting adaptor elements that capture the flexible material therebetween so as to prevent escape of the filler material from the body.

## 3,818,632
## TOY CARS

Duncan Tong, Hong Kong, assignor to Playart Limited, Hong Kong

Filed Jan. 5, 1973, Ser. No. 321,413
Claims priority, application Great Britain, Jan. 31, 1972, 04499/72
Int. Cl. A63h *29/22*
U.S. Cl. 46—243 LV 4 Claims



A toy vehicle having an electric motor which is connected to one of its wheels by an interruptible drive linkage, the engagement of which is controlled by a switch for the motor. The switch member preferably has three positions for "on," "off" and reverse and is arranged to bear against a pivotable motor mounting and to disengage a drive transmitting shaft from the wheel, when moved to the "off" position, so that the vehicle can "free-wheel".

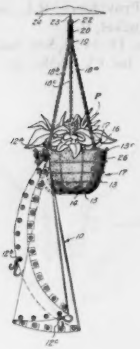
## 3,818,633
## DEVICE FOR AND A METHOD OF WATERING AND FEEDING PLANTS

Donald E. Sable, 4413 Windsor Pky., Dallas, Tex. 75205

Filed Oct. 18, 1971, Ser. No. 190,185
Int. Cl. A01g *31/00*
U.S. Cl. 47—1.2 4 Claims

A device for watering plants rooted in a fibrous substance,

such as peat moss and the like, disposed in a wire or perforate basket. A method of watering and feeding plants rooted in a fibrous substance disposed in a wire or perforate basket.



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**3,818,634**

**TRAY**

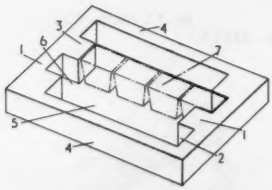
**Charles Dugan-Chapman, London, England, assignor to Stewart Plastics Limited, Croydon, England**

**Filed Aug. 9, 1972, Ser. No. 279,010**

**Claims priority, application Great Britain, Aug. 9, 1971, 37380/71**

**Int. Cl. A01g** *9/02*

**U.S. Cl. 47—34.13** **6 Claims**



A tray for holding an array of containers such as plant pots has alternating projections and recesses or gaps defining a pair of opposed walls so that alternate rows of the containers are relatively staggered to give a quincunx pattern. Preferably said sides have a zig-zag shape in plan view dimensioned so like trays will interlock.

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**3,818,635**

**FIRE DISASTER PREVENTION SYSTEM AND A METHOD TO PREVENT LOSS OF LIFE**

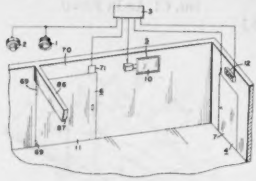
**Yoshio Morita, 9-2, Hatchobori 3-chome, Chou-ku, Tokyo, Japan**

**Continuation-in-part of Ser. No. 211,886, Dec. 27, 1971, abandoned. This application Oct. 27, 1972, Ser. No. 301,651**

**Int. Cl. E05f** *15/20*

**U.S. Cl. 49—2** **1 Claim**

A fire disaster prevention system in which normally locked emergency exit doors are automatically unlocked by detection apparatus comprising sensors detecting output signals upon detection of a physical quantity indicating a fire or smoke is present. Fire doors strategically located are released by automatic release means upon receipt of the sensors' output signals and close automatically to isolate the escape accesses from other spaces to preclude fire and smoke from reaching the emergency exits. The unlocking of the emergency exit doors takes place upon detection of the presence of fire or smoke. The fire doors are closed after time has been allowed for the emergency exits to be reached by those in a building provided with the system. The location of the emergency exits is indicated, upon control of the sensors, visually by respective flashing lights and audible signals developed at the emergency exits so that persons are guided thereto in an emergency.



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**3,818,636**

**HERMETICALLY SEALING CLOSURE DEVICE HAVING A SLIDING DOOR**

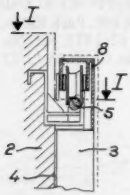
**Bernard Calais, and Luis Vidal, both of Rambouillet, France, assignors to Ste. Bernard Calais S.A.R.L., Rambouillet, France**

**Filed June 26, 1973, Ser. No. 373,635**

**Claims priority, application France, Mar. 7, 1972, 72.24570**

**Int. Cl. E05d** *15/58*

**U.S. Cl. 49—224** **9 Claims**



An assembly for hermetically sealing an opening in a wall comprises a sliding door having sealing means along its bottom edge and along the top and lateral edges of its face adjacent the wall, and suspension rollers which slidably mount the door on a rail fastened to the wall and which are movable along the rail. The rail comprises fixed sections between adjacent ones of which are two sections which are movable between a first position in which the movable sections are aligned with the fixed rail sections and the door is disposed in a raised, clear position which permits it to move along the rail without obstruction, and a second position in which the movable sections are displaced downwards and towards the wall with respect to the fixed rail sections and the door is applied against the wall so that the opening is hermetically sealed. The rollers are arranged to engage the two movable sections respectively when the door is opposite the opening whereby the sections are moved to the said second position.

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**3,818,637**

**APPARATUS FOR QUICKLY OPENING, DAMPING, HOLDING OPEN, AND CLOSING A HINGED CLOSURE MEMBER**

**Albert F. Vivier, Paris, France, assignor to Etat Francais-Delegation Ministerielle Pour L'Armemen, Paris, France**

**Filed July 12, 1972, Ser. No. 271,133**

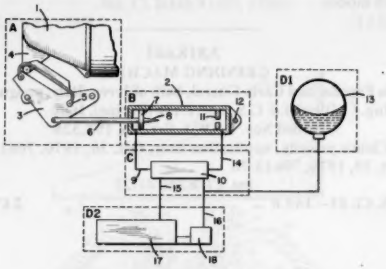
**Claims priority, application France, Dec. 7, 1971, 71.43874**

**Int. Cl. E05f** *1/00*

**U.S. Cl. 49—379** **5 Claims**

Apparatus for quickly opening, damping, holding open and closing a hinged closure member such as a door, comprising a

spring urging a door in an open direction, and a fluid operable jack the piston rod of which is hinged to a variable reduction



lever linked to the door, and the jack and lever are connected to damping and locking systems.

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**3,818,638**

**POLISHING MACHINE FOR FINISHED SHOE SOLES**

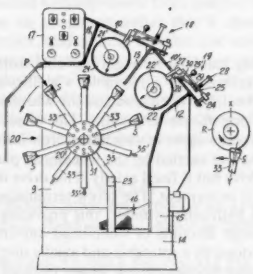
**Giuseppe Pisaroni, Cascine Olona di Settimo, Milan, Italy**

**Filed June 23, 1972, Ser. No. 265,479**

**Claims priority, application Italy, July 2, 1971, 26590/71**

**Int. Cl. B24b** *47/20*

**U.S. Cl. 51—5** **7 Claims**



Disclosed is a polishing machine for finished shoe soles. It comprises: an intermittently rotating dial-arranged support, each spoke of which comprising a pair of uprights carrying a footwear; a pair of rotating brushes lowering at each angular rotation, the upstream brush being the abrading brush and the downstream brush being the polishing brush; a rotary motion of the brushes in opposition to the shoe feeding on the first longitudinal half thereof and a reverse in rotation of the brushes on the second longitudinal half thereof; two mechanisms carrying said brushes and having means for simultaneous rotation and oscillation thereof; a device for intermittently radially moving said dial-arranged support and blocking it at position; two identical mechanisms for distributing abrasive material on the first brush and polishing material on the second brush. The purpose of the invention, is that of automating the operations of the machines for manufacturing shoes.

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**3,818,639**

**APPARATUS FOR SURFACE GRINDING**

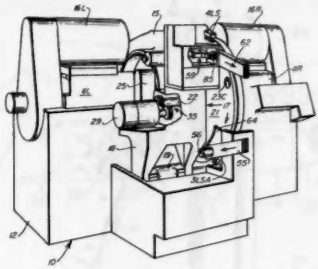
**Elman R. Dunn, Roscoe, Ill., assignor to Litton Industries, Inc., Beverly Hills, Calif.**

**Continuation-in-part of Ser. No. 181,746, Sept. 20, 1971, abandoned. This application Nov. 14, 1972, Ser. No. 306,310**

**Int. Cl. B24b** *7/16, 51/00*

**U.S. Cl. 51—112** **13 Claims**

A grinding apparatus comprising abrasive disc means including at least one abrasive disc, means for mounting the abrasive disc for rotative displacement about the axis of the abrasive disc, means for rotationally displacing the abrasive disc, means for mounting a workpiece having at least one surface to be ground by the abrading action of the face of the abrasive disc, means for displacing the mounting means radi-



ally across the abrasive disc face from a first radial position proximate the outer periphery thereof to a second radial position proximate the center of the face of the abrasive disc, and means for selectively decelerating the displacing means as the mounting means is displaced from the first position to the second position.

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**3,818,640**

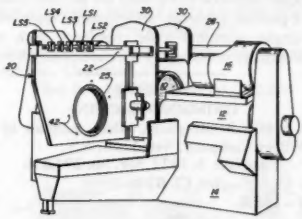
**WORK CARRIER DRIVE FOR DOUBLE DISC GRINDER WITH REVERSIBLE DRIVE AND AUTOMATIC STOP MEANS**

**Elman R. Dunn, Roscoe, Ill., assignor to Litton Industries, Inc., Beverly Hills, Calif.**

**Filed May 31, 1973, Ser. No. 365,585**

**Int. Cl. B24b** *7/02*

**U.S. Cl. 51—114** **9 Claims**

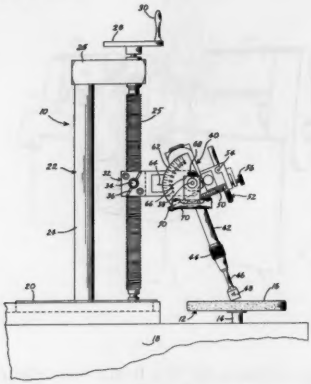


A grinding machine comprising a pair of coaxial abrasive discs, means for rotating the abrasive discs about the axes thereof, a work paddle, means for mounting a workpiece for rotational displacement on the work paddle, means for displacing the work paddle from a first retracted position whereat the workpiece is remote from the abrasive discs to a second advanced position whereat the workpiece is located in the grinding zone intermediate the rotating abrasive discs, means for rotating the workpiece in a first direction when the workpiece is located within the grinding zone, means for rotating the workpiece in a second opposite direction when the workpiece is located within the grinding zone, and means for periodically reversing the direction of rotation of the workpiece.

## 3,818,641
## GEM FACETING MACHINE

Richard H. Long, 1428 E. Park St., Grants Pass, Oreg. 97526

Filed May 25, 1972, Ser. No. 256,817
Int. Cl. B24b 9/16
U.S. Cl. 51—125.5 3 Claims

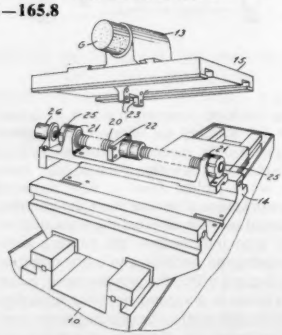


A gem stone faceting machine is provided in which a dop stick holder, secured coaxially on a facet spacing shaft which forms part of a dividing head, has capacity for vertical bodily adjustment, for horizontal oscillation, for fore and aft rocking movement, and for rotary adjustment about its own axis. With reference to fore and aft rocking, a precision level is provided, stable in any indicating position, which tilts in unison with the dop stick holder, and which serves as a visual guide for consistently limiting the cutting of facets which are intended to have identical slopes to fine tolerances which are so exact as to be different in kind from any tolerances which have heretofore been available. With reference to rotary or facet spacing adjustment of the dividing head, and corresponding adjustment of the gem stone, a conventional index gear is provided having a number of teeth which is equal to, or a multiple of, the number of facet cutting positions desired. Instead of a single, fixed scale required to be used for all cuts available with that gear, I provide separate, substitutable scale plates, each having a single, marginal scale, and each with only those markings which are required for the particular job in hand.

## 3,818,642
## GRINDING MACHINE

William B. Seidel, Birmingham, Mich., assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed Oct. 3, 1972, Ser. No. 294,616
Int. Cl. B24b 49/16
U.S. Cl. 51—165.8 71 Claims

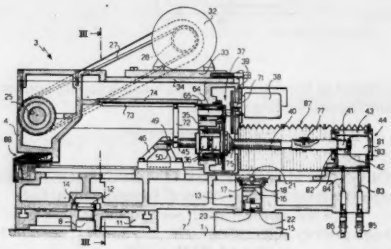


A grinding machine wherein the griding wheel is moved relative to the workpiece by a screw rotated by an electric motor that produces a torque that is proportional to the current applied thereto. The movement of the grinding wheel is controlled in an improved constant force mode or an improved constant rate mode or in an improved combination of both modes.

## 3,818,643
## GRINDING MACHINE

Elio Pagella, and Carlo Guerci, both of Ivrea, Italy, assignors to Ing. C. Olivetti & C.S.p.A., Ivrea (Torino), Italy

Filed Nov. 1, 1971, Ser. No. 194,325
Claims priority, application Italy, Oct. 30, 1970, 70614/70; Oct. 30, 1970, 70613/70
Int. Cl. B24b 47/22
U.S. Cl. 51—165.8 2 Claims

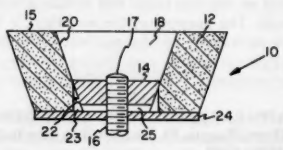


A grinding machine having a movable workhead for carrying a workpiece and a movable wheelhead for carrying a grinding wheel, the workhead and the wheelhead being axially movable along intersecting paths. The wheelhead is provided with a lead screw drive in which the screw is fixed against rotation and the nut carried by the wheelhead platform is rotated by a gear drive but is fixed axially. This drive is used to provide micrometric movement. The screw terminates at one end in a piston in a hydraulic cylinder, this providing piston/cylinder drive for large amounts of wheelhead movement. Workhead feed is provided by a rotatable and axially displaceable spindle drive by a step-by-step electric motor through a gear train that converts the rotary motion output of the electric motion to corresponding axial movement of the spindle.

## 3,818,644
## CUP GRINDING WHEEL ASSEMBLY

Klemens C. Walters, Logan Rd., R.D. No. 1, Box 218, Gibsonia, Pa. 15044

Filed May 3, 1973, Ser. No. 356,935
Int. Cl. B24b 45/00
U.S. Cl. 51—168 3 Claims

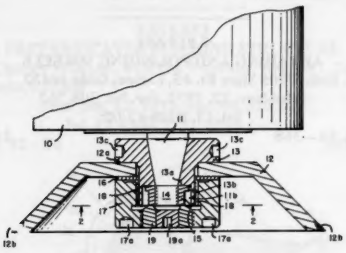


A cup grinding wheel assembly includes an abrasive wheel having a frustoconical central opening therethrough and a mating frustoconical shaped nut secured to the cup grinding wheel through a bayonet coupling. The grinding assembly is positioned on a spindle of a grinding tool.

## 3,818,645
## GRINDING WHEEL ADAPTER

James McEwan, 138 Stockton Ave., San Jose, Calif. 95126

Filed June 4, 1973, Ser. No. 366,873
Int. Cl. B24b 41/00, 17/00
U.S. Cl. 51—168 3 Claims

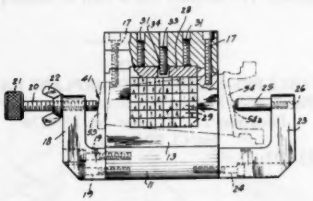


A device for mounting a grinding wheel on the shaft of a motor so that the grinding wheel may be rotated either in a clockwise or counter clockwise direction without danger of it becoming loose. The device includes a cylindrical member mounting the grinding wheel on the tapered shaft of a motor, said member being held on the shaft by a nut, the threads of which are subjected to compressive force exerted thereon by a plug carried by an annular member that is threaded to the cylindrical member, said annular member and said cylindrical member clamping the grinding wheel therebetween. The plug which is threaded into the annular member engages the nut and when it is tightened it applies pressure or tension to all of the threads of the device so that the grinding wheel may be rotated in either direction without coming loose on its mount.

## 3,818,646
## FIXTURE FOR HOLDING PRECISELY SHAPED PARTS

Russell D. Peterson, Hershey, Pa., assignor to TRW Inc., Cleveland, Ohio

Filed Jan. 12, 1973, Ser. No. 323,251
Int. Cl. B24b 41/06; B25b 1/20, 1/24
U.S. Cl. 51—217 R 3 Claims

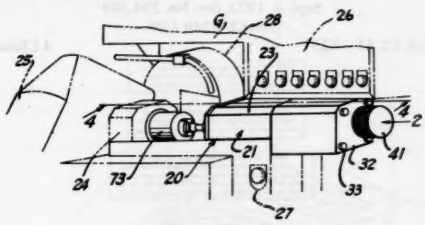


A fixture for holding precisely shaped parts such as blades for jet turbine engines for accurately positioning the parts to enable subsequent grinding or machining operations to be carried out precisely. The fixture includes a base with opposed sidewalls extending therefrom, the sidewalls being spaced to provide a slot of sufficient width to receive the arcuately shaped portions of a turbine blade or the like. Seating means are provided for seating edge portions of the workpiece in the fixture, and a plurality of individually movable pins are positioned to extend from each of the sidewalls into the slot to engage the arcuately shaped portion of the workpiece.

## 3,818,647
## HOLDING AND LOCATING FIXTURE FOR CARBIDE THROW-AWAY INSERTS

Anthony R. Geonnotti, 144 Westbrook Rd., Feasterville, Pa. 19047

Filed July 27, 1972, Ser. No. 275,977
Int. Cl. B24b 3/34
U.S. Cl. 51—218 R 4 Claims

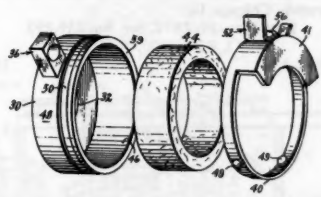


This invention consists of a metal casting mounted on a grinder, the casting is adapted to hold air-operated mechanism in the form of a longitudinally-disposed piston and rod adapted to provide support for a carbide throw-away insert by means of other mechanism, as will hereinafter be described. This air piston and its associated parts is located in the left-hand portion of the aforesaid casting. The casting is provided with an opening between its left-hand portion and its right-hand portion for the reception of the carbide throw-away insert which is held in place by means of an anvil on the end of structure of the internal mechanism of the device in which the aforesaid piston rod is located. The aforesaid carbide throw-away insert is also held in place for grinding by means of mechanism on the end of a locator clamp rod that is longitudinally disposed in the right-hand portion of the aforesaid metal casting. This invention is activated to firmly hold the often-mentioned carbide throw-away insert by means of both air and oil systems, as will hereinafter be described in this specification.

## 3,818,648
## QUICK-CHANGE WHEEL GUARD FOR TOOL AND CUTTER GRINDER

Wendell Irving Evans, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Jan. 10, 1973, Ser. No. 322,278
Int. Cl. B24b 55/04
U.S. Cl. 51—268 7 Claims



A quick-change guard for machine tools supporting a rotating tool, the guard having a backplate located perpendicular to the axis of and to the rear of the rotating tool, the backplate being cup-shaped with the cupped portion partially enveloping the cutting tool. The cupped portion is further suited to receive an energy absorbing liner interposed between the cutting tool and the inner surface of the cupped portion for substantially dissipating the energy of broken tool fragments in the event of wheel fracture. The quick-change guard further

includes a ring releasably secured to the outer surface of said cupped portion, the ring encircling the tool and containing a shield extending therefrom to enclose a substantial portion of the rotating tool.

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**3,818,649**

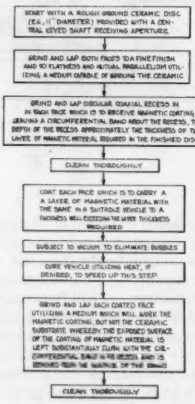
**METHOD FOR FABRICATING A DISCFILE**

**Harold R. Klievoneit, Phoenix, Ariz.**

**Division of Ser. No. 317,731, Dec. 18, 1972. This application Sept. 4, 1973, Ser. No. 394,389**

**Int. Cl. B24b** *1/00*

**U.S. Cl. 51—323** **4 Claims**


WITH A ROUGH GROUND CERAMIC DISC (EX. 11" DIAMETER) PROVIDED WITH A CENTRAL KEYED SHAFT RECEIVING APERTURE
GRIND AND LAP BOTH FACES TO A FINE FINISH AND TO FLATNESS AND MUTUAL PARALLELISM UTILIZING A MEDIUM ABRADE OF ABRADING THE CERAMIC
GRIND AND LAP CIRCULAR COAXIAL RECESS IN EACH FACE WHICH IS TO RECEIVE MAGNETIC COATING LEAVING A CIRCUMFERENTIAL BAND ABOUT THE RECESS, THE DEPTH OF THE RECESS APPROXIMATELY THE THICKNESS OF THE LAYER OF MAGNETIC MATERIAL REQUIRED IN THE FINISHED DISC
CLEAN THOROUGHLY
COAT EACH FACE WHICH IS TO CARRY A A LAYER OF MAGNETIC MATERIAL WITH THE SAME IN A SUITABLE VEHICLE TO A THICKNESS WELL EXCEEDING THE LAYER THICKNESS REQUIRED
SUBJECT TO VACUUM TO ELIMINATE BUBBLES
CURE VEHICLE UTILIZING HEAT, IF DESIRED, TO SPEED UP THIS STEP
GRIND AND LAP EACH COATED FACE UTILIZING A MEDIUM WHICH WILL ABRADE THE MAGNETIC COATING, BUT NOT THE CERAMIC SUBSTRATE WHEREBY THE EXPOSED SURFACE OF THE COATING OF MAGNETIC MATERIAL IS LEFT SUBSTANTIALLY FLUSH WITH THE CIRCUMFERENTIAL BAND IN THE RECESS AND IS REMOVED FROM THE SURFACE OF THE BAND
CLEAN THOROUGHLY

A method for fabricating magnetically responsive circular discs to store magnetically encoded information is disclosed. The faces of rough finished circular discs of ceramic material are ground to a predetermined degree of flatness and mutual parallelism. A centrally located recess is ground in at least one of the faces whereby the perimeter of the recess defines a circular band extending radially outwardly to the edge of the disc. The recess of the disc is coated with a magnetically responsive material to a thickness at least equal to the depth of the recess. Alternately, a coating of magnetically responsive material may be formed across the whole surface of each recessed face. Each recessed face is ground with a grinding medium acting only upon the magnetically responsive material until the coating is essentially flush with the surface of the circular band.

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**3,818,650**

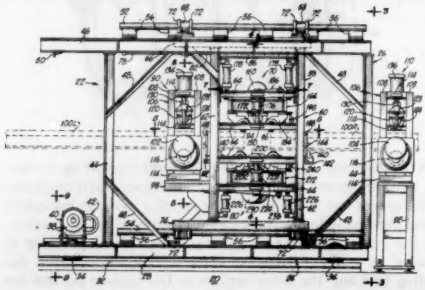
**RAIL GRINDING METHOD**

**Stephen G. Behne, Janesville, Wis., assignor to Chemetron Corporation, Chicago, Ill.**

**Filed Mar. 29, 1972, Ser. No. 239,293**

**Int. Cl. B24b** *1/00, 46/01, 7/00*

**U.S. Cl. 51—326** **10 Claims**



Method and apparatus for grinding surfaces adjacent the ends of a pair of rail section to be welded together comprising means for holding the rail sections in end-to-end aligned, longitudinal relation. Abrasive grinding means movable about an axis of rotation extending laterally of the rail sections and at an acute angle relative to the longitudinal axis thereof is mounted on carriage means slidable longitudinally of the rail section, and pressure means is provided for moving the abrasive member into contact with the surface of the rail sections during longitudinal travel by the carriage.

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**3,818,651**

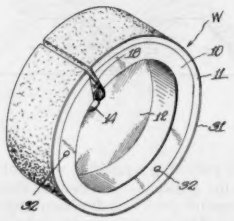
**ABRADING AND POLISHING WHEELS**

**Paul K. Eells, 7905 State Rt. 45, Lisbon, Ohio 44432**

**Filed Nov. 22, 1972, Ser. No. 308,762**

**Int. Cl. B24b** *45/00*

**U.S. Cl. 51—368** **2 Claims**




A wheel for abrading and polishing operations, comprising a web adapted to be connected to a motor shaft, the web having an annular rim with a radial slot tapering from a smaller opening at the periphery of the rim to a larger opening interiorly thereof. A sleeve is rotatably supported between the inclined walls of the rim slot and pressed thereagainst in wedged relation. The sleeve is formed with a longitudinal split and an actuator rod is slidably disposed within the sleeve and has a longitudinal slot. A flexible strip of material, such as sand paper or emery cloth, is disposed about the rim periphery and the two ends of the strip are inserted through the tapered slot and into the aligned sleeve split and actuator rod slot. The actuator rod is manually rotated and this action pinches the two strip ends between margins of the sleeve split and the rod slot so that the sleeve is in turn rotated to wind the two strip ends thereabout. Winding action of the sleeve tensions the flexible strip about the rim periphery and also brings the wound strip ends into wedged frictional engagement with at least one of the two walls of the radial slot, to hold the flexible strip in tensioned relation. The actuator rod is then withdrawn from the sleeve.

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**3,818,652**

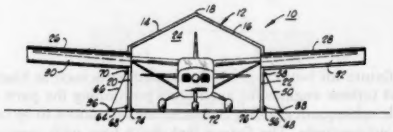
**PORTABLE PRE-FABRICATED AIRPLANE HANGAR**

**Alvin S. Pierce, 6614 McGee, Wheatland, Okla. 73097**

**Filed May 22, 1972, Ser. No. 255,576**

**Int. Cl. E04b** *5/43*

**U.S. Cl. 52—23** **8 Claims**



Portable apparatus for shelter and protection of small airplanes which may be utilized with standardized mooring ring arrays existing at small craft mooring areas of airports. The apparatus is of inexpensive, light-weight pre-fabricated design such that it is capable of rapid assembly and disassembly, ease of transport, yet sturdy weather-resistant stability; the components of the pre-fabricated structure are constructed along

essentially planar design with rectangular/parallel bracing, and in assembled form they constitute a main housing for receiving the fuselage of the airplane and oppositely extending wing coverage nacelles extending on each side of the main housing in position to receive the wings of the airplane. The structure is readily adaptable to receive any of the many types of small aircraft or it may be converted with aid of special accessory structure to receive the larger twin engine aircraft.

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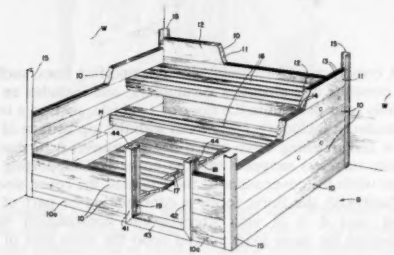
**3,818,653**
**PREFABRICATED BUILDING STRUCTURE**
**Allan Charles Williams, 416 The Westway, Apt. 907, Toronto, Ontario, Canada**
**Filed Jan. 22, 1973, Ser. No. 325,249**
**Int. Cl. E04b** *1/10;* **E04h** *1/12*
**U.S. Cl. 52—79** **10 Claims**



A prefabricated building structure of particular utility as a sauna lodge or steam room comprises horizontal tongue-and-groove wall planks which are rectangularly cut away at their ends to form longitudinally extending tenons. When the planks are disposed one above another, the tenons interfit and flanges provided on external corner holding members are received in slots formed in the outer faces of the planks to hold the planks together in their assembled disposition as well as to provide adequate sealing of the corner.

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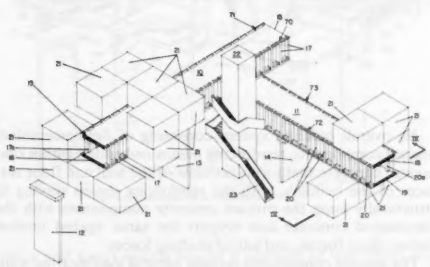
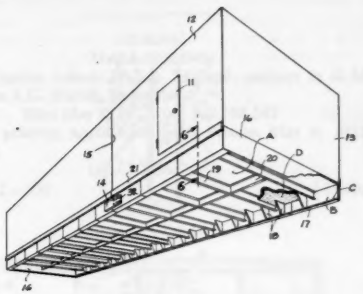
**3,818,654**
**MODULAR BUILDING STRUCTURE WITH HORIZONTAL VIERENDEEL TRUSS**
**Richard A. Schramm, 160 Orchard Ln., Benton Harbor, Mich.**
**Filed Jan. 19, 1970, Ser. No. 3,850**
**Int. Cl. E04b** *1/348*
**U.S. Cl. 52—79** **6 Claims**



A modular building structure includes a corridor frame comprising a plurality of coextensive Vierendeel trusses having at least one common compression chord and at least one common tension chord; and at least one module having a rigid, three-dimensional perimeter framework which defines a space therewithin. The module is rigidly but removably affixed to the corridor frame at a chord thereof.

**3,818,655**
**CONDITIONING UNIT WITH MODULAR CONSTRUCTION**
**William E. Carter, Sr., Piedmont, S.C., assignor to Thermo-Kinetics, Inc., Greenville, S.C.**
**Filed Aug. 21, 1972, Ser. No. 282,346**
**Int. Cl. E04b** *1/348*
**U.S. Cl. 52—79** **3 Claims**



A high velocity air handling assembly, as for conditioning the air in industrial plants which permits entry by service personnel within the assembly, has modular structural units which include a planar horizontally disposed steel plate portion, longitudinally disposed steel plate flanges integral with the horizontally disposed portion, and transverse braces supporting the flanges so that the horizontal portion serves as a floor for supporting components and service personnel, as well as a structural member together with the flanges.

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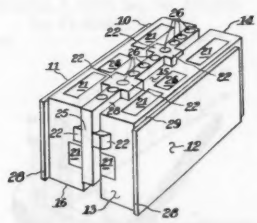
**3,818,656**
**CONSTRUCTION BRICK**
**Peter Vigliotti, Queens, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest**
**Filed Mar. 13, 1973, Ser. No. 340,880**
**Int. Cl. E04c** *1/10;* **E04b** *5/48*
**U.S. Cl. 52—100** **3 Claims**

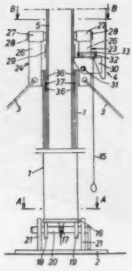


An improved construction brick, which is self-aligning and may be fastened in place without mortar. The top of each brick is formed with a series of pointed projections which mate with matching indentations in the bottom surface of the supported brick, when the bricks are stacked and arranged in the conventional overlapping pattern of construction bricks. Similar interlocking projections and recesses are located on the inner side surfaces of the bricks. Through interior vents are located in the interior of the bricks, with vent passages running from the top to the bottom brick surfaces, and with passageways for utilities.

## 3,818,657
## TELESCOPIC MAST

Ernst Frei, Regensdorf, Switzerland, assignor to Conrad Kern AG, Regensdorf, Switzerland

Filed July 27, 1972, Ser. No. 275,879
Claims priority, application Switzerland, Aug. 13, 1971, 11927/71
Int. Cl. E04h *12/34, 12/18*
U.S. Cl. 52—115 1 Claim

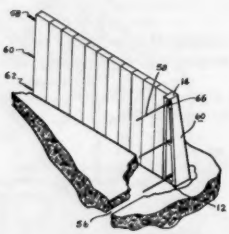


A telescopic mast comprising guidingly interfitted tubular elements which can be extended into a terminal position by means of a pressurized medium at which each extended tubular element lockingly engages with and is releasably retained by a holding mechanism provided at a tubular element such extended tubular element retained by such holder mechanism.

## 3,818,658
## WALL MODULE

Ernest Lynn Slaven, 10632 Morningside, Garden Grove, Calif.

Filed June 7, 1972, Ser. No. 260,457
Int. Cl. E02d *27/01*; E04b *2/26*
U.S. Cl. 52—169 10 Claims

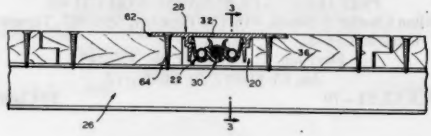


A building block module for construction of vertical walls, panels and the like is described. The block is a tall, free standing hollow core block that reduces the number of horizontal courses of blocks needed to construct a vertical panel. The block has two vertical sidewalls and two open walls and cavity means in the top and at various heights to receive block to block reinforcing means.

## 3,818,659
## CONSTRUCTION FOR MOUNTING AND SUPPORTING LINES, SUCH AS AIR CONDUITS AND ELECTRICAL CONDUCTORS

Leonard M. Anderson, Michigan City, Ind., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Dec. 11, 1972, Ser. No. 313,819
Int. Cl. E04b *5/48*
U.S. Cl. 52—220 6 Claims

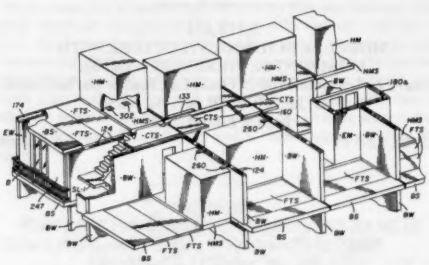


A construction for mounting and supporting lines, such as air conduits and electrical conductors; and includes an assembly incorporated in the floor of a vehicle, such as a truck or trailer; it includes a cover flush with the top surface of the floor and reaching down into a slot or groove; it further includes retainers snapped into the cover and supporting the lines, while the cover supports the retainers; the cover, since it is flush with the floor, forms a continuation or part of the floor, and it is of such strength and construction as to withstand the same loads placed upon the main part of the floor.

## 3,818,660
## BUILDING FORMED OF CAST VERTICAL AND HORIZONTAL MEMBERS

Thomas J. Dillon, Akron, Ohio, assignor to Forest City Dillon, Inc., Akron, Ohio

Filed Nov. 1, 1972, Ser. No. 302,678
Int. Cl. E04b *1/04, 1/16*
U.S. Cl. 52—251 8 Claims



An overall building system consisting of field-assembled, precast components, reinforcing means embedded within site-poured concrete that forms portions of the wall and floor surfaces of the building, with the reinforcing means serving to structurally unite the precast concrete components with the site-poured concrete and support the same against tension forces, shear forces, and lateral shafting forces.

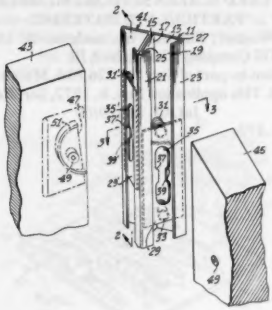
The precast components include vertical load bearing walls each having vertical voids from top to bottom therein, building slabs preferable of half and full thickness adapted to span the bearing walls and receive reinforcing means thereon as well as concrete, precast stairs, an elevator module for each floor of the building, reinforcing means for tension, shear, and lateral shifting prevention purposes, and site-poured concrete first filling the voids of the load bearing wall and then serving as a floor covering for the slabs.

3,818,661

## FASTENING DEVICE FOR PORTABLE PANELS

Alex Van Pragg, III, 20200 Lucille Ave., Cupertino, Calif. 95014

Filed Nov. 22, 1971, Ser. No. 200,924
Int. Cl. E04b 2/82
U.S. Cl. 52—282 7 Claims



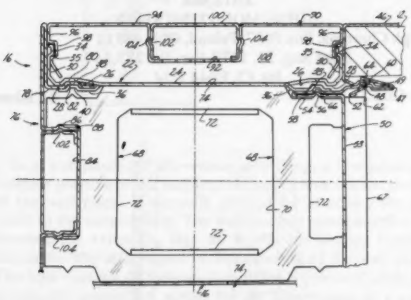
A fastening member for joining panels such as portable partitions, walls, building floors, or building roofs. The fastening member includes one or more elongated hollow channels having a cross-sectional shape of a right triangle. A locking element for fastening with a mating locking element on a panel is slidable along the length of the elongated channel to provide adjustment of its position.

3,818,662

## WALL RETAINER

Camiel R. DeSchutter, St. Clair Shores, Mich., assignor to Perfect Module Systems, Inc., Mt. Clemens, Mich.

Continuation-in-part of Ser. No. 91,083, Nov. 19, 1970. This application Apr. 23, 1973, Ser. No. 353,717
Int. Cl. E04b 2/00
U.S. Cl. 52—285 13 Claims



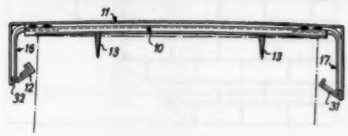
In a wall panel system having a plurality of wall panel sections connected in an end to end fashion, a plurality of vertically disposed retainers are utilized for joining the wall panel sections. One of the retainers comprises a longitudinal member having a U-shaped cross section, the base of which is provided with longitudinal extending deformations on the opposite side thereof adjacent the legs of the member. Tab means are provided at strategic locations along the length of the base adjacent each of the longitudinal deformations to form therein between compressive snap lock means to receive and hold portions of the wall panel sections. A second retainer has an H-shaped cross section. Longitudinally disposed deformations are provided on the legs of the second retainer and function to form compressive snap lock means when used in conjunction with other portions of the wall panel system. The base of the second retainer is provided with selectively positionable tab means, which in one position cooperate with the deformations formed on one pair of the legs to further secure the wall panel member positioned therein between.

3,818,663

## WALL COPING

Francis Charles Adlam, Woling, England, assignor to E. M. Partners A.G., Zurich, Switzerland

Filed May 8, 1973, Ser. No. 358,342
Claims priority, application Great Britain, May 9, 1972, 21656/72
Int. Cl. E04c 2/00
U.S. Cl. 52—300 3 Claims



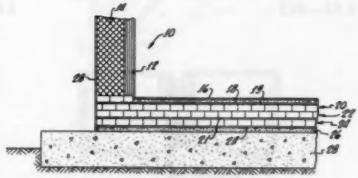
A coping for a wall comprises fixing clips spaced along and secured to the top of wall and having a cambered surface extending across the wall, and coping elements which when free have no camber or a lesser camber than the clips and which are held down on the clips by slidable clips disposed at opposite sides of the wall. The coping elements are made from stiff but resilient sheet material so as to have a drainage camber imparted to them by being held down on the clips beneath but at the same time to be taut and rattle-free.

3,818,664

## INSULATED TANK BASE AND INSULATED BLOCK

Ernest T. Hillberg, La Habra, and Lionel Isenberg, Downey, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 8, 1973, Ser. No. 330,549
Int. Cl. E04c 2/10, 2/36
U.S. Cl. 52—309 7 Claims



An insulated base for a cryogenic liquid storage tank is formed of a plurality of horizontally extending layers of base insulation blocks having a high compressive strength, low thermal conductivity and which are impervious to water vapor. Each block comprises a closed paperboard box of 20"×40"×4" thick having a plurality of vertical divider panels forming a load-bearing grid within the box. All space

within the box is filled with a foam-in-place polyurethane that bonds itself to all surfaces of the box and to the divider panels to thereby laterally support and stiffen the load-bearing panels. Each box is individually encapsulated by being completely covered with a vapor-impervious coating. Additional strength is provided by a tension strip completely encircling the 4-inch sides of the box.

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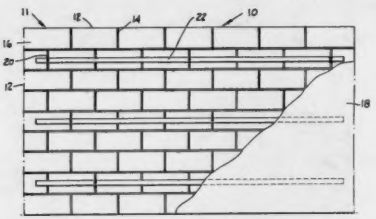
**3,818,665**
**BLOCK-TYPE WALL ASSEMBLY AND METHOD OF CONSTRUCTING THE SAME**
**William M. Rogers, Jr., Littleton, Colo., assignor to Johns-Manville Corporation, Greenwood Village, N.Y.**
**Filed Dec. 1, 1972, Ser. No. 311,197**
**Int. Cl. E04b** *2/42*
**U.S. Cl. 52—375** **2 Claims**




A method of fastening sheet material such as a decorative panel to the planar surface of a block-type wall and the ultimately constructed block-type wall assembly is disclosed herein. The block-type wall is comprised of a plurality of substantially rectangular blocks such as masonry blocks which are spaced apart from one another and held together by mortar type material disposed within substantially all the spaces between the blocks, with the exception of specific ones thereof. These specific unmortared spaces are provided for receiving carefully designed fastening members which are preferably held within the specific spaces by additional mortar type material. In this manner, battens or other such objects can be readily and positively secured to the fastening members or inserts and therefore held against the planar surface of the block-type wall in an economical, rapid, uncomplicated and reliable fashion.

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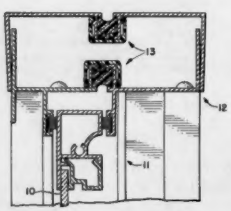
**3,818,666**
**THERMAL BARRIER FOR FRAME STRUCTURES**
**Roy J. Winans, Lakewood, N.J., assignor to Metalume Manufacturing Company, Inc., Lakewood, N.J.**
**Filed Mar. 17, 1972, Ser. No. 235,494**
**Int. Cl. E04b** *1/64;* **E06b** *1/32*
**U.S. Cl. 52—403** **2 Claims**




A thermal barrier joint between two metal extrusion strips comprising a vinyl or other plastic extrusion strip that forms a channel between the two metal strips and also locates the two metal strips with respect to each other, the channel then being filled with a thermal barrier material which rigidly fastens the two metal strips together; the plastic extrusion can either be left on or stripped off after the thermal barrier material has set.

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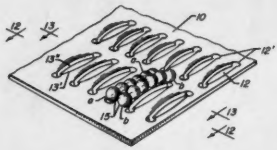
**3,818,667**
**LOUVERED SCREEN SUPPORT MEMBER FOR PARTICULATE MATERIAL**
**Melvin H. Wagner, Bartlett, Ill., assignor to Universal Oil Products Oil Company, Des Plaines, Ill.**
**Continuation-in-part of Ser. No. 126,816, March 22, 1971, abandoned. This application Nov. 6, 1972, Ser. No. 303,908**
**Int. Cl. B01j** *9/00*
**U.S. Cl. 52—473** **7 Claims**




Louvered screen support member for particulate material and especially for ceramic catalyst pellets provides increased resistance to bending in one direction by having vanes which define the louver openings torqued from the plane of a metal sheet in such a way that one lip edge of the vane extends above one side of the metal sheet less than the thickness of the sheet and the other lip edge of the vane extends below the opposite side of the metal sheet less than the thickness of the sheet. The vanes are formed by a punching operation so that the lip edge is elliptically curved in the plane of the edge on one side of the sheet so as to prevent the catalyst pellets from becoming uniformly aligned, and straight on the other side so as to define as large an opening between adjacent vanes as possible. Circular segments formed at the ends of the louver openings eliminate localized stress concentrations which could produce fatigue failure under conditions of severe vibration.

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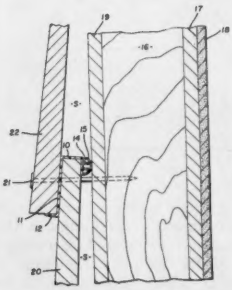
**3,818,668**
**SIDING MOUNTING STRIP**
**Joseph Charniga, Box 5037, Poland, Ohio 44514**
**Filed Aug. 24, 1972, Ser. No. 283,567**
**Int. Cl. E04d** *1/34*
**U.S. Cl. 52—547** **4 Claims**




A siding mounting strip engageable on the upper longitudinal edge of a siding board provides an outturned guide and

support for the lower edge of the next applied siding board thereabove and a longitudinal cushion between the siding board on which the device is applied and the wall surface supporting the same.

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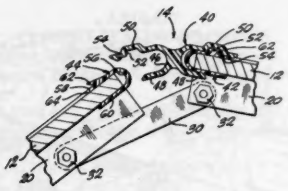
**3,818,669**
**FLEXIBLE JOINT**
**Charles W. Moss, Ann Arbor, Mich., assignor to Tension Structures, Inc., Milan, Mich.**
**Division of Ser. No. 32,051, April 27, 1970, Pat. No. 3,675,380. This application Mar. 1, 1972, Ser. No. 230,808**
**Int. Cl. E04b** *1/32;* **E04h** *1/02*
**U.S. Cl. 52—582** **3 Claims**



A shelter which has panels bowed and secured together in a stressed condition to define a domelike building. An improved flexible joint is provided between the panels to aid in erecting and in retaining the structure together, and to provide a weather seal. A method of erecting the shelter and inserting the flexible joints in place is disclosed.

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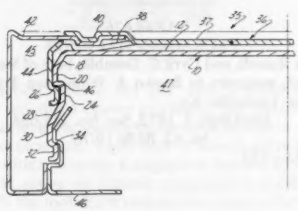
**3,818,670**
**WALL PANEL EXTENSION CLIP**
**Camiel R. De Schutter, St. Clair Shores, Mich., assignor to Perfect Module Systems, Inc., Mt. Clemens, Mich.**
**Filed Apr. 23, 1973, Ser. No. 353,652**
**Int. Cl. E04f** *19/02*
**U.S. Cl. 52—624** **5 Claims**



In a wall panel for use within a building, a U-shaped wall retainer panel member defining the upper termination surface of the wall panel is normally utilized for attaching the wall panel to the room ceiling. The wall retainer panel member has downwardly extending legs on which are formed coupling means for the attachment of components of the wall panel. The base surface of the panel member is provided with longitudinally spaced tab means for the attachment of a cover member that extends outwardly and downwardly from the upper surface of the wall panel to conceal the legs of the wall retainer panel member. An extension clip having a U-shaped cross section is provided with coupling means on its legs which, at selected locations along the length of the wall retainer panel member are engagable between the coupling means of the panel member to attach the clip to the panel member. The legs of the extension clip are provided with second coupling means that are downwardly spaced from the first coupling means and vertically aligned therewith. The clip is attachable to the components of the wall panel in the same manner as the wall retainer panel member and, similarly, is concealed by the cover member. The space formed between the legs of the extension clip and the space formed between the extension clip and the cover member facilitate the passage of wiring within the wall panel.

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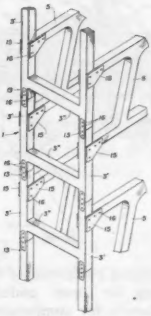
**3,818,671**
**FRAME STRUCTURE**
**Mitsuhiro Matsushita, Kawasaki; Akihiko Miura; Takeshi Uemura, both of Tokyo-to, and Kanji Katoh, Funabashi, all of Japan, assignors to Ishikawajima Harima Jukogyo Kabushiki Kaisha, Tokyo-to, Japan**
**Filed July 26, 1971, Ser. No. 169,570**
**Claims priority, application Japan, Aug. 10, 1970, 45-69862**
**Int. Cl. E04h** *12/00;* **E04g** *7/00*
**U.S. Cl. 52—638** **9 Claims**



A main frame structural unit is assembled by ladder-like column assemblies or trusses and brace-beam members bolted to the column assemblies or trusses with lateral or horizontal splice members, and a plurality of ladder-like column assemblies or trusses spaced apart from the main frame structural member are connected thereto and to each other through connection beams which are bolted to the main frame structural member and the ladder-like column assemblies or trusses.

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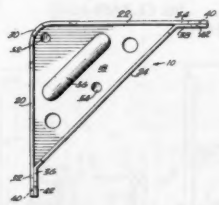
**3,818,672**
**GUSSET**
**John J. Moore, Sr., P.O. Box 686, Marathon, Fla. 33935**
**Filed Jan. 27, 1972, Ser. No. 221,138**
**Int. Cl. E04b** *1/38*
**U.S. Cl. 287—189.36 H** **1 Claim**



A gusset for fastening the corners of hollow frame doors, in a manner so as to prevent opening of the miter joint, comprising a generally right triangular base plate having peripherally upstanding flanges terminating substantially at right angles to the base plate and extending along the angularly related sides and the hypotenuse, each side flange including an end portion extending lineally beyond the hypotenuse and both ends of the hypotenuse flange being provided with extending flanges which are contoured angularly to overlie the extended side flange portions, when the gusset is inserted in place within the

door, fasteners extending through the top and side rails of the door engage in the respective extending hypotenuse portions to draw the miter joint tight.

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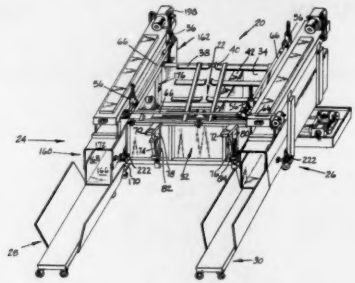
**3,818,673**
**METHOD AND APPARATUS FOR PACKAGING COMPRESSIBLE MATERIALS**

**Forrest Theodore Rollins, Englewood, Colo.; Frank Steve Kubovich, Rossford, Ohio; Kenneth Benning Buess, Littleton, Colo., and Donald Joseph Hartzell, Defiance, Ohio, assignors to Naremco, Inc., Springfield, Mo.**

**Filed Nov. 21, 1972, Ser. No. 308,372**
**Int. Cl. B65b** *63/02*
**U.S. Cl. 53—24** **12 Claims**



A method of packaging compressible materials utilizes an apparatus comprising an open ended hopper with a reciprocating ram therein for compressing materials and a package loading chute at each end of the hopper or compression chamber. The materials to be compressed are placed in the hopper. The ram then moves across the hopper compressing the materials and expelling them from the hopper into one of the chutes. A ram in the chute having the compressed material then expells the compressed material from the chute into a package. While the compressed materials are being expelled from the chute, the hopper is being loaded for the next packaging operation.

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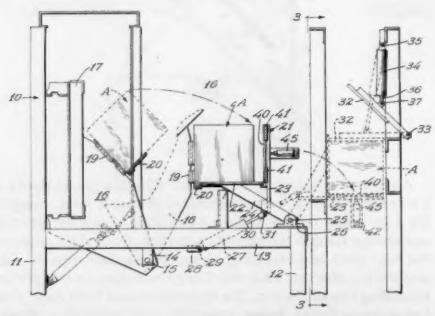
**3,818,674**
**BALE WRAPPING APPARATUS**

**Herbert G. Tull, III, Charlottesville, Va., assignor to Waldorf Corporation, Ramsey County, Minn.**

**Continuation-in-part of Ser. No. 73,967, Sept. 21, 1970, Pat. No. 3,701,314. This application Aug. 8, 1972, Ser. No. 278,774**
**Int. Cl. B65b** *63/02*
**U.S. Cl. 53—124 C** **19 Claims**



A receiving hopper receives a strapped bale or other rectangular object and swings it into alignment with a passageway. The bale is moved into the passageway while held under compression, wrapping a sheet over the leading edge and two opposed surfaces of the bale. The ends of the wrapping sheet are folded over the trailing edge of the bale and adhered together while the bale is still under compression.

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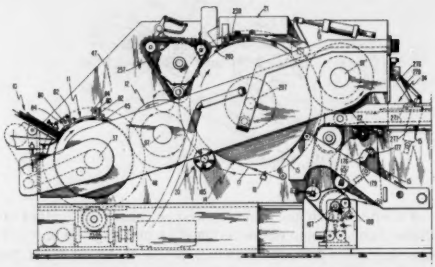
**3,818,675**
**HIGH SPEED WRAPPING MACHINE**

**Arthur J. Griner, Delray Beach, Fla., assignor to Nabisco, Inc., New York, N.Y.**

**Filed May 7, 1973, Ser. No. 357,788**
**Int. Cl. B65b** *61/18, 11/42*
**U.S. Cl. 53—133** **10 Claims**



A machine for wrapping a plurality of stacked biscuits in a single package. The biscuits are fed to the machine stacked on edge in a continuous column. A pick-off wheel removes the biscuits from the column two at a time as a unit and a transfer wheel transfers this unit to a wrapping wheel upon which the unit is partially wrapped and sealed. A second transfer wheel removes the unit from the wrapping wheel and delivers it to a folding plow arrangement which completes the wrapping operation whereupon a final sealing of the wrapping takes place.

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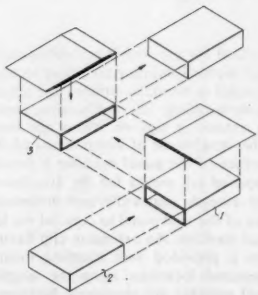
**3,818,676**
**PACKAGING MACHINES**

**Frederick Russell, and Cyril G. Dumbill, both of Southampton, England, assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.**

**Filed Sept. 1, 1972, Ser. No. 285,656**
**Int. Cl. B65b** *19/18*
**U.S. Cl. 53—173** **16 Claims**



A packaging machine for assembling packages consisting of an inner shell into which the package contents are inserted, the loaded inner shell being inserted into an outer shell. The

machine comprises vertical magazines for the empty shells, control means, means for extracting the empty shells from the magazines, means for erecting said shell and for feeding the contents into the inner shell and the inner shell into the outer shell and means for conveying the complete package to a further work station. All the movements imparted to the parts of the package and to the complete package are effected by means operating rectilinearly and all the movements may be effected sequentially by fluid operated means controlled by a fluid logic circuit. Means may also be provided to automatically orient each package into a particular position during its travel through the conveying means and means may be provided whereby movement of a package through the machine controls the sequence of operations.

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**3,818,677**

**CLOSURE SEALING MACHINES**

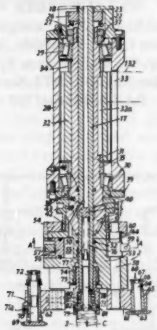
**James Frederick Herbert, Staffordshire, England, assignor to Metal Closures Limited, Bromford Lane, Staffordshire, England**

**Filed Aug. 14, 1972, Ser. No. 280,207**

**Claims priority, application Great Britain, Aug. 27, 1971, 40426/71**

**Int. Cl. B65b** *7/28*; **B67b** *3/18*

**U.S. Cl. 53—338** **12 Claims**



A detachable headset, for use with a closure sealing machine for securing a closure to a bottle, has a number of applying or sealing tools, usually in the form of rollers, arranged around its central axis. Each tool is moved inwardly to its operative position, wherein it engages a closure, by means of pressure fluid acting on a piston contained in a cylinder associated with the tool. Each tool may be mounted at one end of a pivoted actuating arm, the other end of which is engaged by the piston associated with the tool. In a preferred construction pressure fluid is led to the cylinders through the application head of the machine to which the headset is attached.

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**3,818,678**

**METHODS OF AND APPARATUS FOR SEPARATING SOLID AND LIQUID PARTICLES FROM AIR AND OTHER GASES**

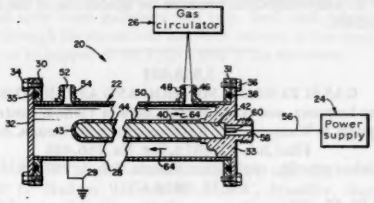
**Nicholas Gothard, c/o Filteron International, Inc., 2322 Irving Blvd., Dallas, Tex. 75207**

**Division of Ser. No. 159,690, July 6, 1971, which is a continuation-in-part of Ser. No. 793,224, Jan. 13, 1969, which is a continuation of Ser. No. 629,465, April 10, 1967. This application Dec. 15, 1972, Ser. No. 315,416**

**Int. Cl. B03c** *3/06*

**U.S. Cl. 55—13** **12 Claims**

Processes and systems for separating solid and/or liquid particles from air or other gases in which the gas is caused to move with the particles dispersed in it to the highest intensity




region of a non-uniform electrical field where the particles are collected.

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**3,818,679**

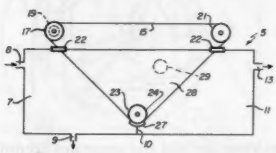
**SEPARATION OF GASEOUS MIXTURES UNDER NON-STEADY STATE CONDITIONS**

**Donald L. Klass, Barrington, and Carl D. Landahl, Chicago, both of Ill., assignors to Institute of Gas Technology, Chicago, Ill.**

**Continuation-in-part of Ser. No. 135,091, April 19, 1971, abandoned. This application Feb. 12, 1973, Ser. No. 331,829**

**Int. Cl. B01d** *53/22*

**U.S. Cl. 55—16** **4 Claims**



A gas mixture is separated into enriched components under non-steady state conditions wherein a gas in a mixture is more favorably collected by a membrane through adsorption, permeation or both, before the composition of such collected gas reaches substantially constant levels.

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**3,818,680**

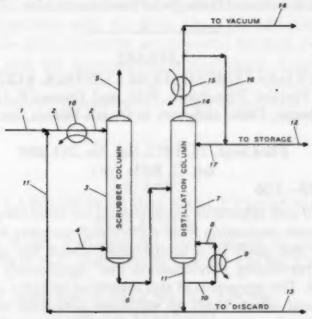
**MALEIC ANHYDRIDE RECOVERY METHOD**

**David M. Marquis, Lafayette, Calif., assignor to Chevron Research Company, San Francisco, Calif.**

**Filed Dec. 17, 1971, Ser. No. 209,069**

**Int. Cl. B01d** *19/00*

**U.S. Cl. 55—48** **25 Claims**




Maleic anhydride is recovered from a gaseous mixture containing the anhydride and water by contacting the mixture

with a normally liquid intramolecular carboxylic acid anhydride, especially at a temperature in the range 55° C. to 260° C. under sufficient pressure for absorption of the maleic anhydride.

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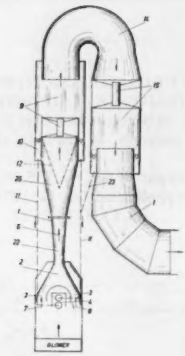
**3,818,681**
**GAS SCRUBBING METHOD AND APPARATUS**
**Heinz Loquenz, and Horst Weber, both of Vienna, Austria, assignors to Waagner-Biro Aktiengesellschaft, Vienna, Austria**
**Filed July 27, 1971, Ser. No. 166,420**
**Claims priority, application Austria, Feb. 1, 1971, 835/71**
**Int. Cl. B01d** *47/10*
**U.S. Cl. 55—90** **6 Claims**



A gas scrubbing method and apparatus according to which the gas which is to be cleaned is directed upwardly toward the throat of a Venturi while a curtain of liquid is dropped downwardly along the upwardly flowing gas at the entrance to the Venturi so that the gas will direct the falling liquid upwardly with the gas through the throat of the Venturi after which the liquid is separated from the gas and returned to the falling curtain of liquid. The Venturi is arranged vertically with the gas flowing upwardly along the interior thereof, and the structure which supplies the liquid is situated at the entrance zone of the Venturi and acts as a baffle for dividing the gas into subsidiary streams which become united at the throat of the Venturi. The Venturi throat is adjusted by a suitable adjusting structure so as to have a cross section adapted to the gas flowing through the Venturi, and the curtain of liquid engaged by the upwardly flowing gas is formed into droplets which are distributed throughout the cross section of the gas.

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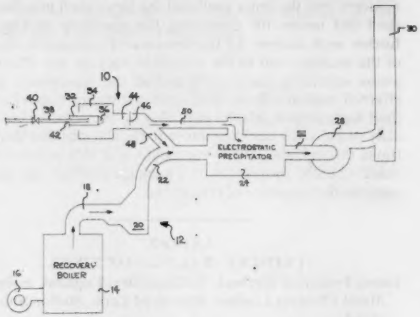
**3,818,682**
**FLUE GAS TEMPERATURE CONTROL SYSTEM**
**Tom Jay Farrow, Tomahawk, Wis., and Thomas P. O'Donnell, Whitehouse, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio**
**Filed Sept. 25, 1972, Ser. No. 291,885**
**Int. Cl. B03c** *3/01*
**U.S. Cl. 55—106** **1 Claim**

Method and apparatus are provided for tempering exhaust or flue gases emanating from a chemical recovery furnace to maintain the gases at a temperature above the dew point thereby preventing condensation and significantly reducing corrosion. The apparatus of this invention includes a gas fired heating unit which heats up sufficient quantities of air to a temperature in excess of the dew point and directs this heated air into an exhaust duct of the recovery furnace and/or into a dust collection device, such as an electrostatic precipitator, located downstream of the recovery furnace. The introduction of heated air into the system may also be utilized to preheat the duct work and precipitator prior to initial operation of the recovery furnace to avoid condensation in a cold system during start-up.

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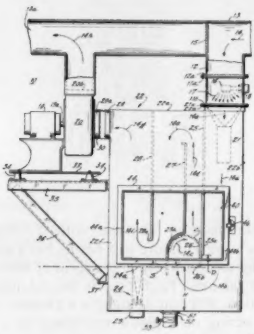
**3,818,683**
**WET SCRUBBER**
**Jack Hirsch, Far Rockaway, N.Y., assignor to Automatic Incinerator Correction Corp., Woodside, N.Y.**
**Continuation of Ser. No. 44,351, June 8, 1970, abandoned.**
**This application Nov. 24, 1972, Ser. No. 309,602**
**Int. Cl. B01d** *47/02*
**U.S. Cl. 55—223** **6 Claims**



A wet scrubber for removing pollutants and other contaminating material from smoke, or other vaporous matter emitted from heaters or burning apparatus such as, for example, incinerators and for removing particulate from any air moving system.

The untreated smoke (or air) enters into the inlet opening of the scrubber housing where it is sprayed with a fine water spray. The smoke (or air) and water passes through a Venturi nozzle, causing admixing of the smoke (or air) and water upon entering the housing. Baffle plates are provided in the housing for causing the smoke (or air) to follow a tortuous, serpentine path in moving through the housing to an outlet opening which is provided with a blower means for drawing the smoke (or air) therethrough.

The water from the spray is collected in the base of the housing. The entering smoke (or air), which has been sprayed, passes beneath the first baffle plate to at least partially enter into the pool of water collected at the base of the housing and is caused to pass through a cascade of water due to a curved

baffle plate which causes any contaminants or pollutant materials to be washed and removed from the smoke (or air) as it passes from the region of the bent baffle plate through the remaining baffle plate structure in exiting through the outlet opening.

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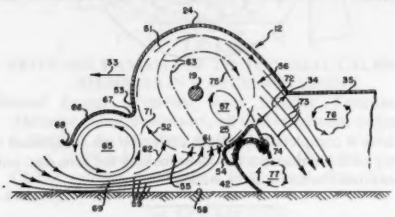
**3,818,684**
**AERODYNAMIC PERFORMANCE OF CROSS-FLOW MOWERS**

**Hugo S. Ferguson, Averill Park, N.Y., assignor to Reel Vortex, Inc., Poestenkill, N.Y.**

**Continuation-in-part of Ser. No. 783,192, Dec. 12, 1968, Pat. No. 3,673,773. This application June 30, 1972, Ser. No. 268,073**
**Int. Cl. A01d** *35/24*
**U.S. Cl. 56—13.3** **12 Claims**



In a lawn mower of the cross-flow blower type, employing a cylindrical reel with circumferentially-spaced cutting blades in a blower conduit having upper and lower wall sections with respective portions close to the reel at circumferentially spaced positions separating inlet and outlet regions of the blower, a curved forward extension of the upper wall section is provided which extends forwardly to the portion thereof close to the reel, the lower surface of the extension being concave in cross-section and designed to produce a vortex therebeneath which rotates in a direction opposite to the direction of rotation of the reel. The convex lower surface of the extension is joined to the upper wall section by a relatively sharp convex bend. Behind the reel, the upper wall section extends downwardly with a gradually increasing separation from the reel and then bends sharply away from the reel in a horizontal plane. The lower wall section extends downwardly and rearwardly in the outlet region, at an angle such that a projection of the surface lies behind the reel axis. Flexible sheets extend downwardly from the lower wall section and from the rear end of the upper wall section.

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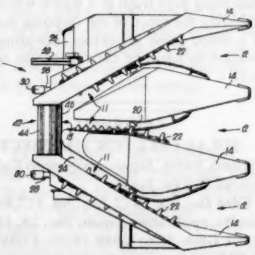
**3,818,685**
**FORAGE HARVESTER HAVING HEADER MOUNTER FEEDER ROLLS**

**Hermann V. Stoessel, and Jack M. Kountz, both of Wichita, Kans., assignors to Hesston Corporation, Harvey, Kans.**

**Filed Apr. 9, 1073, Ser. No. 348,980**
**Int. Cl. A01d** *45/02*
**U.S. Cl. 56—98** **7 Claims**



The detachable header of a forage harvester has crop transfer apparatus in the form of a pair of oppositely driven, vertically spaced apart gripper rolls spanning the discharge throat of the header which receive converging streams of a severed crop from gatherers and grip, feed, and orient the crops through the throat into butt-first delivery to the separate feeder of a chopper on the main frame of the harvester.

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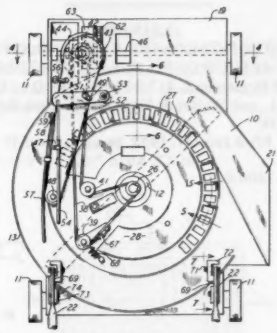
**3,818,686**
**LAWN MOWER PROPELLING DRIVE**

**Donald G. Haffner, Greendale; Neill C. Woelffer, Racine; Charles A. Wuerker, Racine, and Donald G. Erickson, Racine, all of Wis., assignors to Jacobsen Manufacturing Company, Racine, Wis.**

**Filed Jan. 15, 1973, Ser. No. 323,858**
**Int. Cl. A01d** *35/26*
**U.S. Cl. 56—11.1** **3 Claims**



A rotary lawn mower propelling drive wherein the mower has a housing supported by ground wheels which are propelled through the means of a prime mover, such as a gasoline engine. A drive belt extends from the engine and to a drive disc which is in rolling contact with a drive wheel which in turn is geared to a drive shaft connected to the powered ground wheels. The drive disc is a rubber or like material on the face which is in rolling contact with the drive wheel which is of a hard material, such as metal. The drive disc is movable across the plane of the drive wheel so that variable drive speeds can be achieved, and the drive disc is also movable away from rolling engagement with the drive wheel for selective disengaging of the drive. Controls are provided for both the variable speed and the disengagement mentioned. Further, the mower housing itself has a gear box integral therewith, and gears are rotatably supported in the integral gear box.

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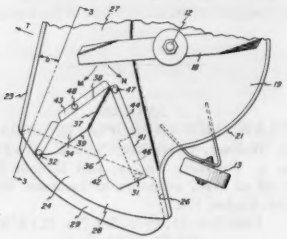
**3,818,687**
**ROTARY LAWN MOWER DISCHARGE CHUTE SAFETY DEFLECTOR**

**Douglas R. Houst, Pattersonville, and Kenneth R. Jones, Elnora, both of N.Y., assignors to General Electric Company, Erie, Pa.**

**Filed Apr. 9, 1973, Ser. No. 349,556**
**Int. Cl. A01d** *67/00*
**U.S. Cl. 56—320.2** **7 Claims**

A V-shaped guard plate is mounted in the mower discharge chute with its vertex toward the inside and its legs diverging toward the front and rear walls of the lateral chute to form side openings to the outside. The resulting pair of diverging paths provide for the conduction of lightweight grass clippings

out the side openings but prevent heavier objects such as stones from being discharged to harm surrounding people or



property. Further, the plate restricts the operator's accidental access to the blade path portion of the discharge chute.

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**3,818,688**

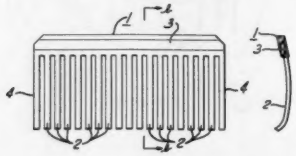
**COMPOSITE INTEGRATED RAKE AND APPARATUS AND METHOD OF MANUFACTURE THEREOF**

**W. Wendell Drummond, 4173 Timberlane Dr., Allison Park, Pa. 15101, and Walter J. Hegedus, 30 Park Rd., Pittsford, N.Y. 14534**

**Filed June 27, 1972, Ser. No. 266,537**

**Int. Cl. A01d** *7/02*

**U.S. Cl. 56—400.01** **17 Claims**



An article of manufacture in the form of a composite integrated rake having a series of parallel or radially aligned resin bonded tines each integral at a common end to a resin bonded stockhead. Each of the tines have substantially unidirectional reinforcement comprising parallel rovings of filamentary material contiguous with a part of the stockhead. The stockhead comprises, in combination with contiguous tine rovings, superimposed unidirectional filamentary rovings transposed in a direction transverse to the direction of the contiguous tine rovings.

The method of manufacturing the rake includes the reciprocal passage of resin dipped rovings deposited in spaced slots forming rake tines in combination with transversely disposed resin dipped rovings deposited before and/or after depositing of the tine roving to form the integrated stockhead of the rake, followed by curing of the composite rake structure.

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**3,818,689**

**DIGITAL DISPLAY MECHANISM FOR A TIME-KEEPER**

**Jacques Muller, Reconvilier, Switzerland, assignor to Ebauches Tavannes S.A., Berne, Switzerland**

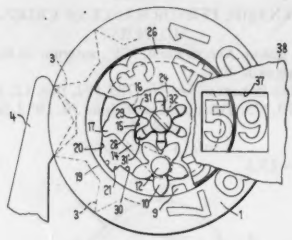
**Filed Nov. 19, 1973, Ser. No. 416,837**

**Claims priority, application Switzerland, Dec. 6, 1972, 17742/72**

**Int. Cl. G04b** *19/24, 19/02*

**U.S. Cl. 58—5** **8 Claims**

The invention concerns a click mechanism for a clock or calendar, having two indicating or number discs but only one click or detent spring, thus reducing the friction in, and the driving force required by, the mechanism. The units disc has a click wheel and spring, and is driven step-by-step by known means. When the figure 0 enters a display opening, the units disc turns a spur wheel which drives a second spur wheel attached to the tens disc, through a limited angular distance.



The drive is completed by a lever driven by the completion of the step of the units disc, the lever locking the tens disc until the next time the disc is to be stepped.

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**3,818,690**

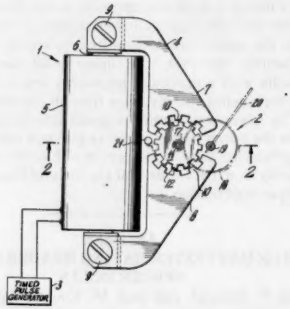
**STEPPING MOTOR FOR WATCH MOVEMENT**

**Gunter J. Schwarzschild, Stamford, Conn., assignor to Timex Corporation, Waterbury, Conn.**

**Filed Nov. 21, 1973, Ser. No. 417,997**

**Int. Cl. G04c** *3/00*

**U.S. Cl. 58—23 D** **4 Claims**




A single phase reluctance stepping motor suitable for driving a time indicating gear train in a watch which incorporates a detent for holding the rotor of the stepping motor in a stable position and a timed pulse generator providing DC pulses of sufficient duration to advance the rotor from one stable position to the next.

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**3,818,691**

**SOLAR CELL FOR TIMEPIECE**

**Hideaki Uchiyama, Suwa, Japan, assignor to Kabushiki Kaisha Surva Seikosha, Tokyo, Japan**

**Filed Dec. 26, 1972, Ser. No. 317,890**

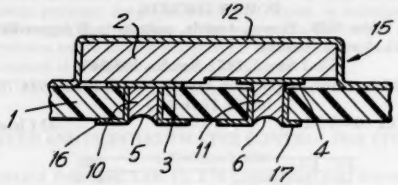
**Claims priority, application Japan, Dec. 28, 1971, 47-3342**

**Int. Cl. G04c** *3/00;* **G04b** *19/06;* **C08k** *1/10*

**U.S. Cl. 58—23 C** **4 Claims**

A solar cell utilized for operating a timepiece is improved in

appearance by the application of a flatting paint to the light-




sensitive surface thereof. The composition of the paint is such that the efficiency of the solar cell is not seriously decreased.

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3,818,692

## DRIVE MECHANISM FOR TWO COAXIAL CALENDAR MEMBERS IN WATCH MOVEMENT

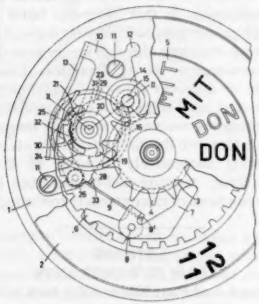
**Roland Zaugg, Grenchen; Kurt Schaller, Lengnau, and Alphonse Bron, Bassecourt, all of Switzerland, assignors to A. Schild S.A., Grenchen, Switzerland**

**Filed Sept. 24, 1973, Ser. No. 400,140**

**Claims priority, application Switzerland, Oct. 13, 1972, 14973/72**

**Int. Cl. G04b** *19/24*

**U.S. Cl. 58—58** **10 Claims**




A drive mechanism for two coaxial calendar members meant to rotate in stepwise manner about their common axis in a watch movement, comprising a drive member provided with two finger-pieces for actuating one of each of the calendar members, a calendar wheel connected to the gear-train and coaxial with the drive member, a coupling with angular play between the calendar wheel and the drive member, a cam rigidly connected to the drive member, a lever operating in concert with the cam, and a spring acting on the lever such that it will ensure an instantaneous jump of the two calendar members by rotation of the drive members after the latter has been brought into a given orientation by the calendar wheel. The invention is further characterized in that the contour of the cam is provided with a retaining notch operating in concert with the lever and limiting the rotation of the drive member under the influence of the spring.

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3,818,693

## ELECTRONIC METRONOME

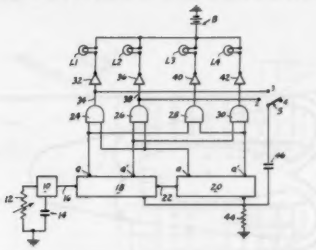
**Frank L. Allard, 1834 Hobart Dr., Camarillo, Calif. 93010**

**Filed Oct. 25, 1973, Ser. No. 409,548**

**Int. Cl. G04b** *19/00*

**U.S. Cl. 58—130 E** **5 Claims**

A circuit including an oscillator generates pulse signals energizing selectively spaced indicator lamps excited in a pattern corresponding in location to the pattern described by an orchestra leader's hand movements indicating standard beat locations.

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3,818,694

## METHOD FOR REMOVING THE BURR OF CHAIN-LINKS

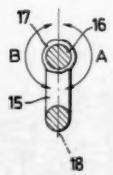
**Adolf Englisch, 29 Weilerswister St., Cologne 51, Germany**

**Filed Mar. 13, 1972, Ser. No. 234,351**

**Claims priority, application Germany, Mar. 11, 1971, 2166660**

**Int. Cl. B21l** *15/00*

**U.S. Cl. 59—29** **5 Claims**




A method and apparatus for removal of weld-burrs from chain links formed by welding rods of circular cross-section. A cutter having a cutting edge shaped to conform to the periphery of the cross section of the chain link rod and extending over substantially 180° of the chain link periphery is mounted so as to be capable of reciprocatory movement along an axis of the cutter, which axis is arranged to be parallel to a longitudinal plane of symmetry of the chain link. The cutter is also capable of controlled rotation about its own axis, the rotation being in a plane transverse to said longitudinal plane. A weld-burr which extends circumferentially of a chain link cross section is removed in two stages in a semicircular portion each time, by shearing the weld-burr in a longitudinal stroke of the cutter each time; the cutter is rotated on its own axis to be positioned for each longitudinal shearing and push off stroke from a first starting position. The stresses developing in the chain link during burr-removal operations are limited to those in a longitudinal direction of the chain link and accordingly the chain link need be secured during burr removal only in the longitudinal direction.

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3,818,695

## GAS TURBINE

**Eugeniusz Michael Rylewski, 43 Avenue du General Leclerc, 78 Saint-Remy-Les-Chevreuses, France**

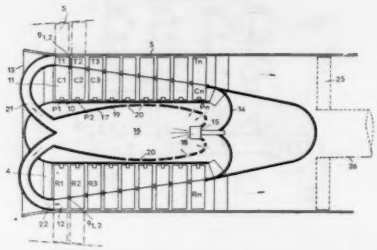
**Filed Aug. 2, 1971, Ser. No. 168,112**

**Int. Cl. F02c** *3/10, 7/16*

**U.S. Cl. 60—39.16 C** **6 Claims**

A gas turbine of the type having a plurality of axial compressor stages. The entire unit is mounted in a tubular support in-

cluding coaxially mounted compressor and turbine blades for rotation independent of one another. The compressor blades are mounted in a ring radially inwardly of the ring of turbine



blades, a combustion chamber is disposed radially inwardly of the ring of combustion ring. The gas first flow through the ring of compressor blades and then through the ring of turbine blades.

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**3,818,696**

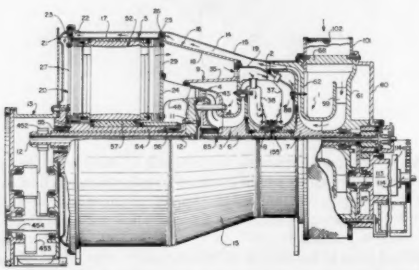
**REGENERATIVE AIR-COOLED GAS TURBINE ENGINE**

**Albert H. Beaufrere, Private Rd., Huntington, N.Y. 11743**

**Filed Oct. 25, 1972, Ser. No. 300,774**

**Int. Cl. F02c** *7/10*

**U.S. Cl. 60—39.51 H** **20 Claims**



A regenerative air-cooled gas turbine engine, particularly applicable to and adequately clean burning for automotive and like applications requiring small size at a power rating in the 100–400 h.p. range. The engine is characterized by having the compressor, combustor, drive and power turbines, and regenerator all concentric with the longitudinal axis. The cool air supplied from the compressor to the regenerator passes in a tubular shroud-like flow which surrounds all but the compressor end of the engine and thus encloses the hot section of the engine. Cool air direct from the compressor output is ducted to the combustor and pre-mixed with run fuel supplied by a slinger which separately introduces run fuel and start/idle fuel, the pressure of the latter being boosted by a damper bearing acting as a fuel pump. Simplicity and low manufacturing cost are achieved by having substantially all gas flow confining surfaces in the form of surfaces of revolution. Cooling of nozzle vanes and the drive turbine impeller blades by air ducted from the tubular flow allows turbine gas inlet temperatures of 2,200° F. and higher. The regenerator is of the rotary disc type and has low cost, easily maintained non-rubbing seals.

**3,818,697**

**POWER PLANT AND METHOD FOR GENERATING PEAK POWER THEREIN**

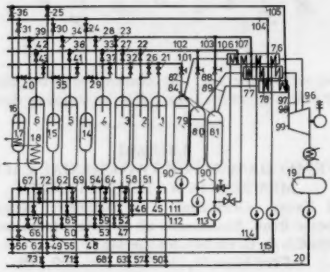
**Paul Viktor Gilli, Vienna, Austria, assignor to Waagner-Biro A.G., Vienna, Austria**

**Filed Nov. 5, 1971, Ser. No. 195,947**

**Claims priority, application Austria, Nov. 6, 1970, 9986/70**

**Int. Cl. F01k** *3/12*

**U.S. Cl. 60—94 A** **33 Claims**



A power plant, such as a nuclear power plant, and a method for generating peak power therein. The power plant has a thermal accumulator installation composed of main and superheat accumulators so that after the latter are charged steam for peak-power purposes may be derived therefrom in order to operate a turbine through steam generators and superheaters connected to the accumulators through conduits which operate at different pressure-and-temperature levels. The contents of at least some of the accumulators are circulated by a circulating means a plurality of times through the latter accumulators with the circulated contents of any one accumulator being successively directed to flow paths of progressively lower pressure-and-temperature levels during successive circulations of its contents therethrough.

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**3,818,698**

**STEAM POWER PLANTS**

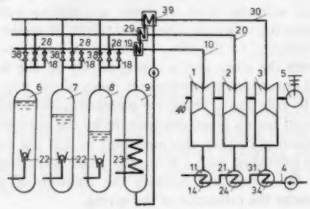
**Georg Beckmann, and Paul Viktor Gilli, both of Vienna, Austria, assignors to Waagner-Biro Aktiengesellschaft, Vienna, Austria**

**Filed Aug. 31, 1972, Ser. No. 285,328**

**Claims priority, application Austria, Sept. 2, 1971, 7653**

**Int. Cl. F01k** *3/12*

**U.S. Cl. 60—94 A** **17 Claims**



A power plant which has an installation capable of accumulating energy during low-load periods and discharging the accumulated energy during peak-load periods. The installation includes steam accumulators which store a charge of steam under pressure until the energy thereof is required during a peak-load period. During discharge of the steam the pressure thereof gradually diminishes, and through a suitable conduit system the steam is delivered first to a turbine designed for op-

timum operation at an upper steam pressure range at which the steam is first discharged, and then steam is delivered to another turbine which is designed for optimum operation at a lower pressure range at which the steam is subsequently discharged, so that at any given instant the discharged steam operates only a turbine designed for optimum operation at the pressure at which the steam is discharged.

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**3,818,699**

**FEED AND INJECTION WATER CONTROL FOR STEAM GENERATORS**

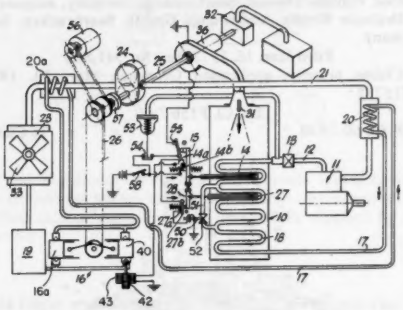
**Edward Pritchard, Unit 11, 176 Canterbury Rd., Bayswater, Victoria, Australia (3153)**

**Filed Apr. 25, 1972, Ser. No. 247,279**

**Claims priority, application Australia, Apr. 30, 1971, 4769/71**

**Int. Cl. F22d** *1/28, 7/00*

**U.S. Cl. 60—665** **22 Claims**



A steam generator control system including a once through steam generator, a superheater thermostat sensing the temperature of superheater steam in the generator and controlling a fluid injection circuit connected in parallel to a portion of the steam generator coil to supply injection water to the coil and also, controlling the supply of feed water supplied to the steam generator, the feed water supply being controlled substantially proportional to the amount of exhaust steam issuing from a steam consuming apparatus together with extra water when called for by the thermostat, said control being provided by a positive displacement motor such as a rotary motor driven by the exhaust steam, and including auxilary governing means for the rotary motor to ensure more accurate proportionality between the speed of the rotary motor and the supply of feed water requirement to the steam generator so that full utilization of steam generator burner output is obtained for any given requirement.

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**3,818,700**

**RAM JET POWERED BY A LASER BEAM**

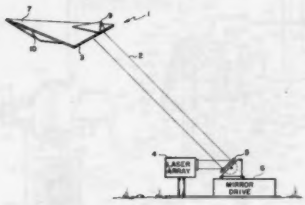
**Arthur R. Kantrowitz, Cambridge, and Richard J. Rosa, Everett, both of Mass., assignors to Avco Corporation, Cincinnati, Ohio**

**Filed Oct. 20, 1972, Ser. No. 299,589**

**Int. Cl. G21d**

**U.S. Cl. 60—203** **8 Claims**

A ram jet vehicle is powered in flight by laser beam radiation which heats the ram jet gas in the vehicle combustion chamber or exhaust nozzle. The beam is incident upon the vehicle or a part thereof that directs the radiation to the ram jet gas in the combustion chamber or exhaust nozzle. The gas is sufficiently absorptive of the radiation either intrinsically or



because of added material to absorb substantial power from the beam and thereby add to the gross thrust of the jet gas.

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**3,818,701**

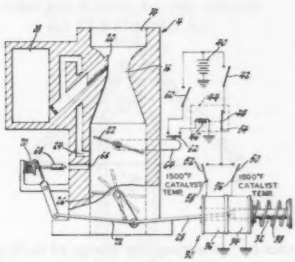
**CARBURETOR INDUCTION LIMITING DEVICE**

**Michael R. Foster, Goodrich, and Frederick J. Hartley, Columbiaville, both of Mich., assignors to General Motors Corporation, Detroit, Mich.**

**Filed May 24, 1973, Ser. No. 363,605**

**Int. Cl. F02b** *75/10*

**U.S. Cl. 60—277** **3 Claims**



An induction limiting device includes an additional valve below the throttle valve in an engine mounted carburetor. A solenoid with two actuating coils normally holds the valve open against the bias of the spring, with the opening of the switch in response to a specified high catalytic converter temperature disables one of the coils and allows the valve to partially close while the opening of another switch in response to higher catalytic converter temperature disables the other coil and allows the valve to fully close. A switching network is also effective to disable both actuating coils upon simultaneous full throttle closure and engine speed in excess of the speed reference level.

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**3,818,702**

**OVERRIDE CONTROL FOR A DIVERTER VALVE**

**Ji Yah Woo, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.**

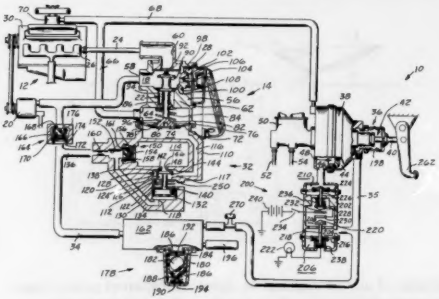
**Filed Feb. 15, 1973, Ser. No. 332,971**

**Int. Cl. F15b** *13/04;* **F02b** *75/10;* **B60t** *13/18*

**U.S. Cl. 60—290** **12 Claims**

An override control associated with a diverter valve in an emission control system for directing air from a pump to a ser-

vomotor in response to a sensed braking potential. A differential pressure sensor in the override control will maintain



the directed air at a predetermined pressure to provide a uniform predictable output from the servomotor.

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**3,818,703**

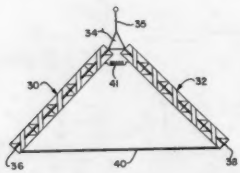
**WAVE ENERGY CONVERTER ARRAY**

**James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, New Orleans, La.**

**Continuation-in-part of Ser. No. 148,775, June 1, 1971, abandoned. This application June 25, 1973, Ser. No. 373,443**

**Int. Cl. F03c** *5/02*

**U.S. Cl. 60—504** **15 Claims**



Apparatus for converting the energy of surface waves in a liquid such as an ocean, comprising an array of buoyant helical members each mounted for rotation about an axis. The pitch of the helical members equals or is greater than the length of the expected waves and the members are floated on the surface with their axes oriented so that wave length of the waves matches the pitch of the helices times the cosine of the angle between the helical axes and the direction of wave propagation. In one embodiment the array is a large chevron formed of two groups of helical members and is pivotable about the apex of the chevron. In another embodiment the helical members are arranged in zig-zag fashion. Means are provided for adjusting the angles between the arms of the chevron in the one case, and the adjacent arms of the zig-zag in the other case.

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**3,818,704**

**APPARATUS FOR CONVERTING THE ENERGY OF OCEAN WAVES**

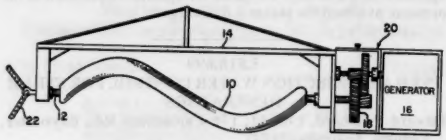
**James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, New Orleans, La.**

**Filed June 25, 1973, Ser. No. 373,395**

**Int. Cl. F03c** *5/02*

**U.S. Cl. 60—504** **16 Claims**

Apparatus for converting the energy of surface waves in a liquid such as an ocean, comprising a buoyant helical member mounted for rotation about an axis. The pitch of the helical member approximates the length of the expected waves and the member is floated on the surface with its axis oriented so that each wave traverses the helix lengthwise and buoyantly




supports successive sections thereof causing it to rotate about its axis. The helix is coupled with rotary driven means such as an electrical generator.

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**3,818,705**

**POWER BOOST DEVICE**

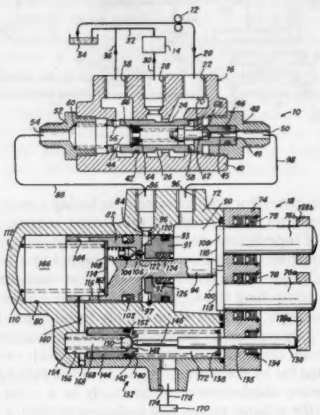
**Alfred William Thomas, Saarbrucken, Germany, assignor to Deutsche Bendix Austustungs GmbH, Saarbrucken, Germany**

**Filed Mar. 16, 1973, Ser. No. 341,805**

**Claims priority, application Germany, Mar. 30, 1972, 2215752**

**Int. Cl. F15b** *7/00*

**U.S. Cl. 60—548** **16 Claims**

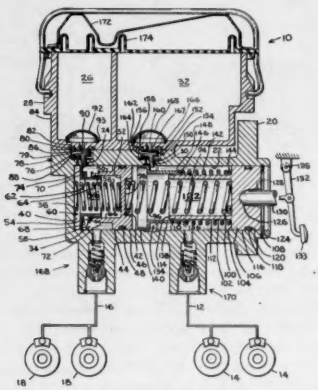


A power boost device for a split braking system for an agricultural tractor, comprising a servomotor and a servo valve. The valve housing is provided with an inlet port, an output port and an exhaust port. The spool valve, movable in the valve housing, includes a central bore and radial passages to selectively communicate the inlet port and the exhaust port with a work port connected to the working chamber of the servomotor. An output piston is located in said working chamber and comprises a plunger projecting into an enclosed control chamber. Into said control chamber are also projecting two input plungers respectively connected to independent brake pedals. The control chamber is connected to a cavity located at one end of the servo valve housing, in which is slidably mounted the end of the spool valve. The output piston pressurizes a brake chamber connected to two separated braking systems through the intermediary of two control valves independently actuated by the brake pedals.

## 3,818,706
## MASTER CYLINDER WITH RESILIENTLY SEPARATED PRIMARY AND SECONDARY PISTONS

Robert F. Gaiser, St. Joseph, Mich., assignor to The Bendix Corporation, South Bend, Ind.

Filed Dec. 3, 1971, Ser. No. 204,550
Int. Cl. F15b 7/08
U.S. Cl. 60—562 9 Claims

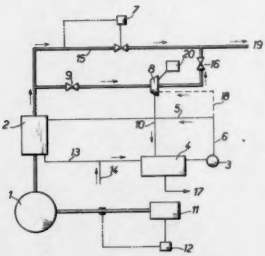


A master cylinder for use in a dual hydraulic system having first and second pistons individually activated by independent resilient means responsive to an input force supplied by an operator.

## 3,818,707
## METHOD AND APPARATUS FOR RECOVERING THE ENERGY OF EXPANSION OF WET DUSTY GASES UNDER PRESSURE

Jean Boudard, Florange, and Louis Marcellin, Marcq-en-Bareuil, both of France, assignors to Wendel-Sidelor and Societe D'Aerodynamique et de Thermodynamique Francaise, Boulogne, France

Filed Feb. 16, 1972, Ser. No. 226,847
Claims priority, application France, Feb. 17, 1971, 71.5402
Int. Cl. F01k 7/34, 7/22; F22d 11/00
U.S. Cl. 60—64 3 Claims

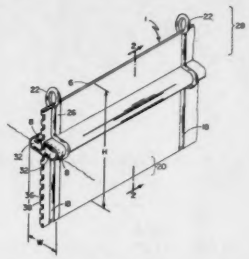


For recovering energy from a dust-laden wet gas under pressure such as blast-furnace gas, the degree of saturation of the gas is raised in a first stage by water evaporation, and in a second stage the gas is expanded through a turbine while its degree of saturation is at least equal to that obtained after the first stage.

## 3,818,708
## FLOATING BARRIER

Robert A. Benson, Cohasset, Mass., assignor to Submarine Engineering Associates, Inc., Cohasset, Mass.

Filed Feb. 2, 1972, Ser. No. 222,867
Int. Cl. E02b 15/04
U.S. Cl. 61—1 F 12 Claims

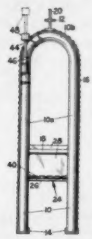


A floating barrier capable of permanently enclosing an area at sea is made up of sections each comprising a solid vertical dam with stiffening ribs and substantially continuous flotation extending laterally from opposite sides of the dam, the floatation preferably being foam filled tubes, adjacent sections of the barrier preferably being hinged to each other.

## 3,818,709
## PROTECTIVE CAGE FOR TRENCH WORKERS

Van A. Gibson, 6510 S.E. Jack Rd., Milwaukie, Oreg. 97222

Filed Jan. 4, 1973, Ser. No. 320,916
Int. Cl. E21d 5/00, 5/12
U.S. Cl. 61—41 A 3 Claims



A protective cage for trench workers having a plurality of inverted U-shaped frame members supporting a mesh covering. The cage is open at the bottom and ends and the U-shaped frame members are connected together by a top longitudinally extending frame member and bottom longitudinally extending frame members. A folding seat is mounted inside of the cage, and holding means is associated with the seat to secure the operator thereon when the cage is moved into or out of a trench. Safety indicating means are operable by the holding means to signal a person on the ground surface the position of the holding means.

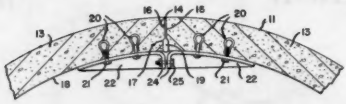
## 3,818,710
## TUNNEL LINERS

Nicholas Chlumecky, Youngstown, Ohio, assignor to Commercial Shearing & Stamping Company, Youngstown, Ohio

Filed Dec. 3, 1971, Ser. No. 204,438
Int. Cl. E21d 11/00; E01g 5/04
U.S. Cl. 61—45 R 6 Claims

A tunnel liner is provided made up of a plurality of side-by-side annuli, each formed from a plurality of precast arcuate

trapezoidal segments of substantially equal size, shape and thickness with sealing means between each segment of each



annulus whereby a finished sealed lining is provided in one step of lining installation.

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**3,818,711**

**STABILIZING ARCTIC GROUND COVER**

**Albert C. Condo, Newtown Square, Pa., and Joseph J. N. Neubauer, Burlington, Iowa, assignors to Atlantic Richfield Company, New York, N.Y.**

**Filed Feb. 18, 1972, Ser. No. 227,664**

**Int. Cl. E02d** *17/18, 3/10, 27/32*

**U.S. Cl. 61—50** **14 Claims**

Described are techniques for stabilizing, restoring the ground-cover in Arctic (or like, frozen) environments including, in specific embodiments, techniques for: restoring and revegetating a spoil pond for spent drilling mud; refreezing and insulating of "pond crossings"; restoring "winter roads" and like tundra scars; leveling "arctic roads" and constructing ice foundations for arctic pads.

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**3,818,712**

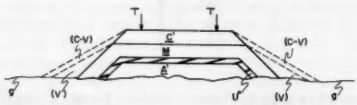
**FROZEN EMBANKMENTS**

**Glenn R. Burt, Deer Park, Tex.; Albert C. Condo, Newton Square, Pa.; Kay E. Eliason, Fort Madison, Iowa, and John J. McCormack, Villanova, Pa., assignors to Atlantic Richfield Company, New York, N.Y.**

**Filed July 10, 1972, Ser. No. 270,315**

**Int. Cl. E02d** *17/18, 27/32*

**U.S. Cl. 61—50** **24 Claims**



Improved particulate embankment structures for use in cold environments and on frozen terrain are described together with methods of construction; generally involving the introduction of up to a prescribed amount of moisture homogeneously dispersed throughout the particulate embankment such as to maximize the ice content thereof yet without appreciably moving the particles relative to one another or risking any such moving subsequently such as frost heaves, subsidence or the like. Also described are methods and arrangements for coating terrestrial and similar substrates with urethane foam and like materials. Various aspects of the preferred methods are illustratively described such as the application of foams in a laminate form; the application of a petroleum base pre-coating or similar moisture barrier; the application of petroleum based super-coatings or similar sealant; subjection of the foam and related coatings to certain heating during application; and the "staggering" of successive foam layers.

**3,818,713**

**DRIVING OF TUNNELS**

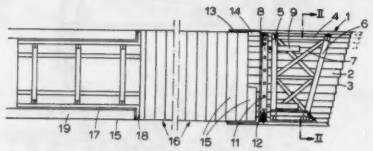
**Armin Lobbe, Oberaden, Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Westfalia, Germany**

**Filed Sept. 16, 1971, Ser. No. 180,961**

**Claims priority, application France, Sept. 24, 1970, 70.34576**

**Int. Cl. E01g** *3/00*

**U.S. Cl. 61—85** **7 Claims**



An apparatus for driving a tunnel, the apparatus having a knife shield composed of a circular array of elongate knife implements supported by a frame and attachable to a drive frame which can be moved to cause the implements to penetrate into a working face in order to excavate material therefrom. To the rear of the knife shield there is an advanceable temporary lining composed of tube sections arranged end-to-end and designed to support the newly-formed tunnel. This advanceable lining extends into a rear shield composed of a rearwardly extending portion of the implements lined with plank members.

A tubular revetment has a flange which abuts the advanceable lining at the side remote from the knife shield and fluid concrete is inserted around the periphery of the revetment to form a permanent tunnel lining, separated from the advanceable lining by the flange. The advanceable lining and the revetment are moved up from time to time as the driving progresses.

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**3,818,714**

**PROCESS FOR THE LIQUEFACTION AND SUBCOOLING OF NATURAL GAS**

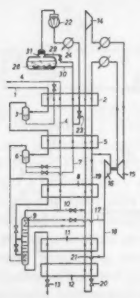
**Volker Etzbach, Munich; Wolfgang Forg, Grunwald, and Peter Grimm, Munich, all of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Germany**

**Filed Mar. 6, 1972, Ser. No. 231,984**

**Claims priority, application Germany, Mar. 4, 1971, 2110417**

**Int. Cl. F25j** *1/00, 1/02, 3/00*

**U.S. Cl. 62—11** **13 Claims**



A process for the liquefaction and subcooling of natural gas with a Claude closed refrigerating cycle comprising compressing gaseous cycle medium; cooling resultant compressed gaseous cycle medium; dividing cooled compressed gas into two streams; engine-expanding one stream; and cooling the

other stream with the engine-expanded stream to such an extent that said other stream becomes partially liquefied after a subsequent throttle expansion thereof; the improvement comprising employing as the cycle medium, a mixture of nitrogen and methane.

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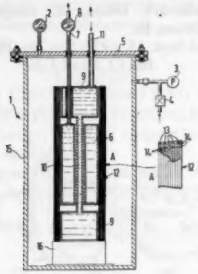
**3,818,715**

## HEAT-INSULATING CONSTRUCTIONS

**Ralph Geoffrey Scurlock, Southampton, England, assignor to National Research Development Corporation, London, England**

**Filed July 6, 1972, Ser. No. 269,292**
**Claims priority, application Great Britain, July 9, 1971, 32462/71**
**Int. Cl. F25b *19/00***
**U.S. Cl. 62—45** **3 Claims**



A heat-insulating construction, especially for use in low temperature vacuum vessels. The construction comprises material of high resistance to the flow of heat with which is mixed a substance exhibiting a strong cryopumping action. Carbon and alumina are typical such substances, which may be mixed in the construction by impregnation. If the construction is formed in thin layers the substance may be distributed by being applied to some or all of the layers, especially layers of low thermal conductivity.

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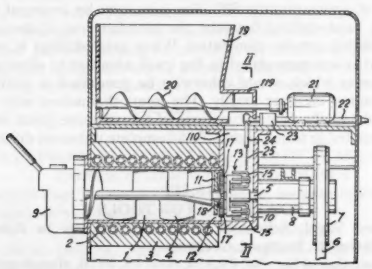
**3,818,716**

## CONTINUOUS ICE CREAM MACHINE

**Poerio Carpigiani, Anzola Emilia, Bologna, Italy**

**Filed June 25, 1973, Ser. No. 372,927**
**Claims priority, application Italy, July 4, 1972, 12760/72; Nov. 30, 1972, 13045/72**
**Int. Cl. F25c *7/10***
**U.S. Cl. 62—178** **7 Claims**



A continuous ice cream machine comprises a freezing cylinder, in communication with an adjoining mixing chamber. The dry product component for the ice cream mix is fed in measured amounts by a screw conveyor feeder into the mixing chamber, while the liquid component is also fed into the mixing chamber by a delivery spout of a pipe connected to a suitable source of liquid. The two components are thoroughly and intimately mixed in the mixing chamber by an agitator which comprises beater elements actuated by the rotation of the same shaft of the mixer of the freezing cylinder. A level feeler, which senses the level of the mix in the mixing chamber, automatically controls the actuation of the feeding devices for the dry product and the liquid, and the feeding of said components into the mixing chamber.

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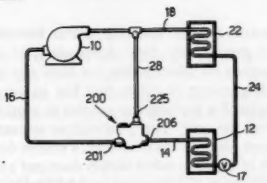
**3,818,717**

## REFRIGERATION PLANT SUITABLE FOR AIR CONDITIONING SYSTEMS

**Marco Peruglia, Turin, Italy, assignor to Fiat Societa per Azioni, Turin, Italy**

**Filed Mar. 12, 1973, Ser. No. 340,630**
**Claims priority, application Italy, Apr. 19, 1972, 68225/72**
**Int. Cl. F25b *41/04***
**U.S. Cl. 62—217** **1 Claim**



A refrigeration system which is particularly suitable for air conditioning units for motor vehicles is disclosed. The system includes a compressor which is permanently connected to the engine of the vehicle and thus is running whenever the engine is running, a condenser, and an evaporator, the outlet of the evaporator being connected to the compressor *via* a control valve which is controlled by a barometric capsule sensitive to the pressure at the inlet of the compressor, and which closes so that the flow path therethrough is a minimum constricted orifice when the pressure at the inlet falls below a critical threshold value representing approach of the frosting temperature at the evaporator, to effectively stop the operation of the refrigeration system. The minimum flow during cut-off is required to ensure that the continuously rotating compressor is not damaged.

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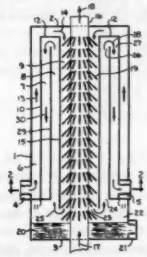
**3,818,718**

## HEAT EXCHANGER FOR COMPRESSED AIR DRYER

**Charles E. Freese, 5140 Woodland, Forest Park, Ga. 30050**

**Filed Apr. 26, 1973, Ser. No. 354,890**
**Int. Cl. F25d *21/00***
**U.S. Cl. 62—272** **16 Claims**

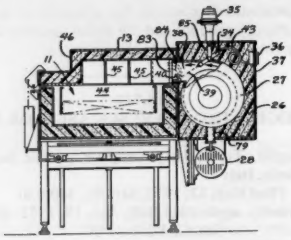


A heat exchanger for removing moisture from compressed air and other gases in which the precooling, cooling and reheating sections are in telescoped relation.

## 3,818,719
## REFRIGERATING APPARATUS

**Ronald A. Banike, Elmhurst, Ill., assignor to Integral Process Systems, Inc., Park Forest, Ill.**

**Filed Mar. 8, 1973, Ser. No. 339,396**
**Int. Cl. F25d** *17/02*
**U.S. Cl. 62—374** **5 Claims**

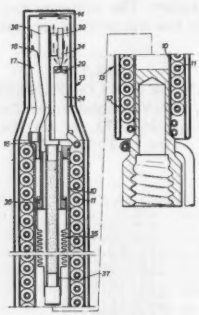


An apparatus for refrigerating, either freezing or chilling, articles and particularly food items using an improved distribution system for distributing the fluid cryogen uniformly across a refrigerating chamber that has an entrance, an exit and a conveyor for moving the articles in a path between the entrance and the exit. The distribution system comprises a cryogen supply duct to the chamber, a nozzle device for ejecting a stream of cryogen into a supply duct and a deflector at an angle to the stream for intercepting and dispersing the stream across the duct and thereby across the width of the chamber.

## 3,818,720
## CRYOGENIC COOLING APPARATUS

**David Neil Campbell, Alcester, England, assignor to The Hymatic Engineering Company Limited, Redditch, Worcestershire, England**

**Filed Sept. 5, 1972, Ser. No. 286,828**
**Claims priority, application Great Britain, Sept. 6, 1973, 41541/73**
**Int. Cl. F25b** *19/00*
**U.S. Cl. 62—514** **6 Claims**

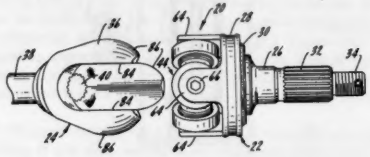


Cooling apparatus includes a generally tubular heat exchanger affording two paths through one of which refrigerant gas from a supply under pressure flows from one, warm, end of the heat exchanger, which in the normal position of use is uppermost, to the other, cold, end and there through a Joule Thomson expansion nozzle, some of the gas being liquefied in a container while thhe remainder returns through the other path, a valve member co-operating with the nozzle to vary its effective area, and a sensor which is located in the container and arranged so that as it comes into heat exchange relationship with liquid refrigerant, it will cause the valve to reduce the effective area of the expansion nozzle. To enable the apparatus to operate effectively in an inclined or inverted position or an accelerated condition the end wall of the container is in heat exchange relationship with a load and the nozzle is directed towards the said end wall to direct the refrigerant to impinge on it, and the sensor has a surface inclined at a small angle to a side wall of the container and spaced from it so as to leave between them a capillary gap tapering to a minimum, in which a liquid drop will be retained in any orientation and the area of the sensor in contact with the liquid will vary widely with the size of the drop. A shield is provided between the sensor and the stream of refrigerant spray from the nozzle to the end wall.

## 3,818,721
## CONSTANT VELOCITY UNIVERSAL DRIVE

**Gunnar A. Wahlmark, Dixon, Ill., assignor to Wahlmark System, Inc., Dixon, Ill.**

**Filed Sept. 15, 1972, Ser. No. 289,585**
**Int. Cl. F16d** *3/30*
**U.S. Cl. 64—21** **21 Claims**



A universal drive employing at least one constant velocity universal joint of the three-roller type employing a trunnion member and a track member. The trunnion member carries three drive rollers rotatably secured for universal tilting on respective trunnions which are rigidly secured in equiangularly spaced relation with their axes defining a plane perpendicular to the axis of rotation of the trunnion member. Each of the rollers has a generally cylindrical outer peripheral surface disposed in close-fitting, rolling relationship in one of three equiangularly spaced drive channels or tracks formed in the track member. Each of the channels is defined by a pair of opposed parallel flat surfaces also parallel to the axis of the track member. As the two members rotate in driving relation with their axes angularly disposed, the roller peripheral surfaces roll against the channel surfaces and the rollers also tilt universally on their trunnions as required to accommodate relative orbital movement of the centers of the members with respect to one another. The resulting drive is constant velocity with high torque capacity at any desired joint angle, from 0° up to angles of approximately 50°. The joint may be arranged for relative axial shifting between the members, or, if desired, axial shifting can be eliminated. When axial shifting is provided, it is accommodated in the track member to eliminate axial forces which would otherwise be generated in shifting the trunnion member axially. The joints themselves may be employed singly, or combinations of two or more joints may be connected in series to provide a complete universal drive.

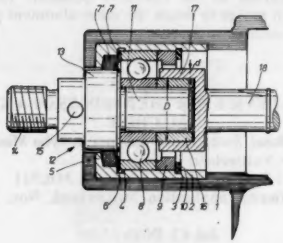
## 3,818,722
## POWER UNIT FOR TOOLS

**Eberhard Vogel, Schonaich, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany**

**Continuation of Ser. No. 89,354, Nov. 13, 1970, abandoned. This application Sept. 1, 1972, Ser. No. 285,865**
**Int. Cl. F16d** *7/02*
**U.S. Cl. 64—30 E** **4 Claims**

A power unit for tools comprises a drive and a tool spindle which is mounted to be rotated by the drive. The tool spindle

has a free end portion, and slip coupling means surrounds the



free end portion and serves for connecting the tool spindle and drive in torque-transmitting relationship.

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**3,818,723**

**MULTI-FEED CIRCULAR KNITTING MACHINE HAVING AN IMPROVED PATTERNING MECHANISM**

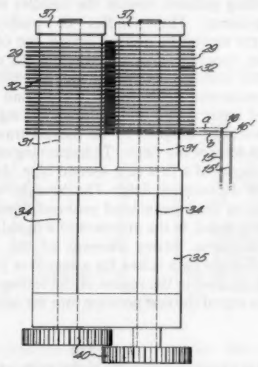
**Ronald Harris, Leicester, England, assignor to Stibbe Machinery Limited, Leicester, England**

**Filed June 16, 1972, Ser. No. 263,558**

**Claims priority, application Great Britain, June 28, 1971, 30139/71**

**Int. Cl. D04b** *15/74*

**U.S. Cl. 66—50 B** **8 Claims**



A circular multi-feed knitting machine having a patterning unit in the form of a series of toothed discs positioned at each feed, wherein the discs of adjacent stacks of discs are in interleaved and overlapping relationship with one another, needle selection being effected by presser jacks each having a single reading butt which co-acts with selected ones of said discs.

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**3,818,724**

**DATA PROGRAMMING DEVICE, PARTICULARLY FOR CONTROL OF KNITTING MACHINES**

**Norbert Paul Bourgeois, Troyes, France, assignor to Etudes et Bonneterie S.A., Laussane, Switzerland**

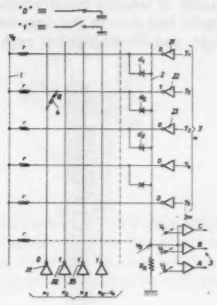
**Filed June 26, 1972, Ser. No. 266,350**

**Claims priority, application Switzerland, July 1, 1971, 9703/71**

**Int. Cl. D04b** *15/78*

**U.S. Cl. 66—50 R** **3 Claims**

A data programming device for the selective control of the needles of a circular or straight bar knitting machine includes a two plane matrix whose points of intersection may be connected by one of several types of diode plug either without a resistor or with a certain value of resistor in series, thereby defining several different types of data, each plug advantageously having means for visually indicating the type of



data it defines. The rows and columns are associated with electronic switches to enable interrogation thereof by means of a computer, and a discriminator circuit is provided for identifying the different types of data during interrogation.

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**3,818,725**

**METHOD AND APPARATUS FOR PRODUCING WARP AND WEFT INTER-KNITTED FABRICS**

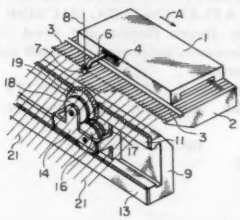
**Yoshio Sakuragawa, Kyoto, and Kiyoshi Honma, Otsu, both of Japan, assignors to Toray Industries, Inc., Tokyo, Japan**

**Filed Jan. 24, 1972, Ser. No. 220,278**

**Claims priority, application Japan, Jan. 28, 1971, 46-2629; June 1, 1971, 46-37440**

**Int. Cl. D04b** *7/00*

**U.S. Cl. 66—62** **19 Claims**



Warps and wefts are simultaneously knitted together into selected loops of a fabric while the warps are transferred laterally passing over a prescribed number of needles by one or more sets of warp transferers travelling parallel to the needle bed in synchronism with the carriage holding cams operative on the needles.

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**3,818,726**

**NEEDLE SELECTING MECHANISM FOR FLAT KNITTING MACHINES**

**Gunther Kazmeier, and Wilhelm Hadam, both of Reutlingen, Germany, assignors to H. Stoll and Company, Reutlingen, Germany**

**Filed Feb. 27, 1973, Ser. No. 336,237**

**Int. Cl. D04b** *7/00, 15/66*

**U.S. Cl. 66—75** **6 Claims**

In a flat knitting machine, a needle selecting mechanism comprises electromagnets energizable at the dictates of the pattern, movable with the machine carriage and serving as

selectors for needles or needle-actuating jacks (knitting instrumentalities) displaceably mounted in the slots of the needle beds. Armatures associated with the knitting instrumentalities are movable toward the selector electromagnets against spring influence by means of presser cam parts. The poles of a plurality of selector electromagnets extend over a plurality of needle bed slots in the direction of travel of the machine carriage, and are arranged at each selection zone of

the cambox such that the pole of a single magnet is located between the poles of a pair of spaced electrically connected magnets. The knitting instrumentalities are of two forms, one form having a single central armature bearing portion for cooperation with the single electromagnets, and the other form having two symmetrically spaced armature bearing portions for cooperation with the pairs of spaced selector electromagnets. The knitting instrumentalities of the two forms are alternately arranged in successive needle slots.

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**3,818,727**

## APPARATUS FOR CONTROLLING THE MOVEMENTS OF A FLAT KNITTING MACHINE

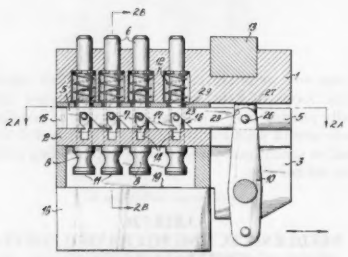
**Wilhelm Hadam; Jurgen Ploppa, and Ernst Goller, all of Reutlingen, Germany, assignors to H. Stoll and Company, Reutlingen, Germany**

**Filed Jan. 2, 1973, Ser. No. 320,173**

**Claims priority, application Germany, Dec. 30, 1971, 2165538**

**Int. Cl. D04b** *15/52*

**U.S. Cl. 66—127** **10 Claims**



The abutment pins which control, e.g. reverse, the movements of a flat knitting machine are controlled such that the selected ones thereof are resiliently held in an operative position, e.g. by a spring, and hence need not be held in an operative position by the armature of an electromagnet under electrical tension. A control member moves all abutment pins to a withdrawn position where they are held by a permanent magnet, the field of which is then locally and selectively offset to release selected abutment pins, permitting them to be resiliently moved to the operative position. The control member then moves to retain the other abutment pins in the withdrawn position.

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**3,818,728**

## CONTROL DEVICE FOR THE NEEDLES OF A KNITTING MACHINE

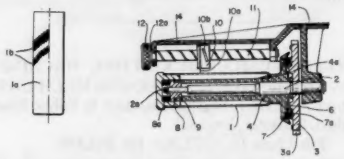
**Ernst Erb, Basel, Switzerland, assignor to Erba Maschinenbau AG, Basle, Switzerland**

**Filed Nov. 30, 1972, Ser. No. 310,711**

**Claims priority, application Switzerland, Nov. 30, 1971, 17397/71**

**Int. Cl. D04b** *15/66*

**U.S. Cl. 66—154 A** **12 Claims**



A control device for the needles of a knitting machine having a control element which, in accordance with a predetermined knitting pattern, selects the needles required for the knitting process. The needles or pushrods associated tnerewith are moved by a drive device, out of a rest position and into an operative position, wherein the control element has a surface which is divided up into electrically-conductive and nonconductive fields which correspond to the knitting pattern and are scanned consecutively during operation by a scanning element adapted to be moved transversely to the direction of feed of the fields. This scanning element provides an output signal of a first or a second type, depending on the character of the scanned fields. The drive device is moved past the needles or their associated pushrods synchronously with the scanning speed. In the presence of a signal of the first type, an electomagnetic setting element of the drive device is moved so that the path is free for a needle or pushrod which at this time is located in the region of the setting element so that it can move out of the rest position into the operative position.

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**3,818,729**

## BRAKE YOKE ROD RETAINER FOR AUTOMATIC WASHERS

**Richard R. Kenreich; Paul L. Schulz, both of St. Joseph; Albert Houck, and Gerald L. Kretchman, both of Stevensville, all of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.**

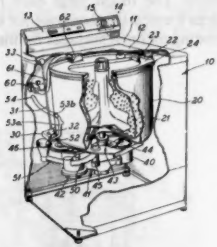
**Filed Jan. 10, 1973, Ser. No. 322,305**

**Int. Cl. D06f** *37/40*

**U.S. Cl. 68—23.7** **3 Claims**

A retainer device for maintaining a first member such as a brake yoke in an automatic washer in engagement with a second member such as a brake yoke rod. The retaining member has a central disc portion with an aperture therethrough. A segmented tubular member projects from one side of the disc coaxially with the aperture and terminates in out-turned flanges adjacent the ends of the segments. The other side of the disc has a plurality of circumferentially spaced fingers projecting therefrom terminating in in-turned flanges. The segmented tubular projection is inserted into an aperture in the first member having a diameter less than the outer diameter of the out-turned flanges, the segments being resilient to allow insertion through the aperture, and the flanges retaining the retainer in engaged relation with the first

member. The second member having a cylindrical portion with an increased diameter bulge thereon, is inserted through



the apertures in the segmented tubular portion and the disc portion with the bulge portion entrapped between a surface of the disc and the in-turned flanges of the fingers.

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**3,818,730**

**PROCESSING DRUM FOR TREATING HIDES**

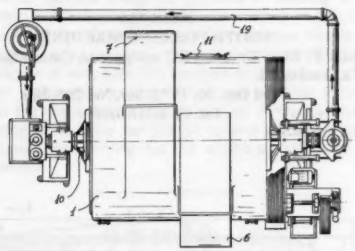
**Manuel Portavella Casanova, and Antonio Casacuberta Santaeulalia, both of Vich (Barcelona), Spain, assignors to Colmer Munmany S.A., Barcelona, Spain**

**Filed Mar. 22, 1973, Ser. No. 343,895**

**Claims priority, application Spain, Mar. 27, 1972, 401217**

**Int. Cl. C14c** *1/00*

**U.S. Cl. 69—30** **4 Claims**



The present invention relates to drums for hide-treatment processes in which the hide loading and unloading operations are effected automatically by simple reversal of the direction of rotation, introducing or removing them from the radial apertures directed in the same direction though diametrically opposing each other and located at the ends of two rectangular section ducts close to each other and fitting over more than 180° of the outside of the drum cylindrical face, communicating by the other end in the form of a bend with the inside of the drum. Connections also located diametrically opposite each other.

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**3,818,731**

**NUT LOCK**

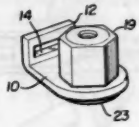
**Thomas A. Waling, Milford, and Edwin J. Waling, White Lake Twp., both of Mich., assignors to Waling Tool Company, Dearborn, Mich.**

**Filed Jan. 16, 1973, Ser. No. 324,204**

**Int. Cl. F16b** *41/00*

**U.S. Cl. 70—232** **7 Claims**

An improved lock for preventing unauthorized removal of a nut. In one embodiment, a plate having a flange at one edge is locked in a housing. An integral nut and retainer are journaled in an aperture in the plate with the nut and retainer on opposite sides thereof. The nut is threaded on a stud and the housing locked in place to preclude access to the nut. In



another embodiment, such as where a cable having a coupling member is to be protected, the plate has an aperture shaped to receive the coupling member. The plate is locked in a housing which has an aperture through which the cable passes.

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**3,818,732**

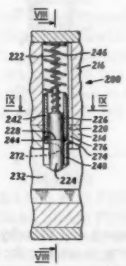
**CYLINDER LOCK CONSTRUCTION**

**Leonard F. Tria, Jr., 560 St. George Ave., North Babylon, N.Y. 11703, and Edward A. Wiacek, 1268 Burton Ave., Elmont, N.Y. 11003**

**Filed Mar. 7, 1973, Ser. No. 338,988**

**Int. Cl. E05b** *15/14, 27/04*

**U.S. Cl. 70—359** **3 Claims**



A cylinder type lock having shield means encircling the tumblers therein is disclosed. The shield means is provided as a split line structure like the lock tumblers but can have a lifting or displacement travel thereof for moving the split line thereof to the lock shear line which is different than that required for an associated tumbler. Employment of shield means in association with a tumbler makes the lock more difficult to pick.

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**3,818,733**

**PIERCING PROCESS**

**William J. Cauley, Beaver Falls, and Joseph F. Maykuth, Aliquippa, both of Pa., assignors to The Babcock & Wilcox Company, New York, N.Y.**

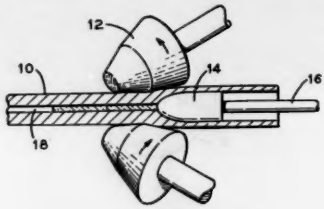
**Filed July 17, 1972, Ser. No. 272,614**

**Int. Cl. B21b** *17/10*

**U.S. Cl. 72—41** **4 Claims**

An improvement in the piercing of difficult to pierce metal alloy billets where the billet is drilled throughout its axial

length, a lubricating material such as glass inserted in the fore end of the bore of the billet, and the billet then heated to a




working temperature. The hot billet is readily pierced with the lubricant facilitating in the piercing process.

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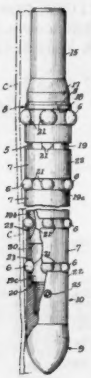
**3,818,734**
**CASING EXPANDING MANDREL**
**J. W. Bateman, 9245 Priscilla Ave., Downey, Calif. 90242**
**Filed May 23, 1973, Ser. No. 363,245**
**Int. Cl. E21b** *29/00*
**U.S. Cl. 72—75** **5 Claims**



A mandrel for swaging and thereby expanding a collapsed oil well or similar casing to restore the same to its original size and form, the mandrel having a mandrel body formed to have successively smaller cylindrical portions in which are provided groups of conduit-swaging balls in circular arrangement around the axis of said body, the groups of balls, starting at the lower end of the mandrel body, being arranged in successively larger circles so the casing expansion size increases as the mandrel, on the end of a drilling string, is being rotated and lowered as permitted by the progressive expansion of the casing.

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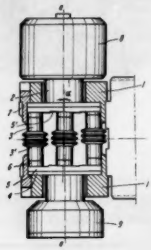
**3,818,735**
**ROLLER HEAD FOR COLD ROLLING OF SPLINED SHAFTS OR GEARS**
**Ernst Grob, Meilen, and Hans Krapfenbauer, Ernetschwil, both of Switzerland, assignors to Ernst Grob, Mannedorf, Switzerland**
**Filed Apr. 23, 1973, Ser. No. 353,900**
**Claims priority, application Germany, Apr. 21, 1972, 2219663**
**Int. Cl. B21h** *3/02*
**U.S. Cl. 72—78** **8 Claims**

A rotating roller head for the cold rolling of both straight and helical mutually parallel grooves in the surfaces of approximately cylindrical work pieces, including a rotatably mounted spindle, a pair of spaced apart thrust rings mounted coaxially on the spindle and a plurality of rollers mounted between the thrust rings and revolving with the spindle in a planetary fashion. The thrust rings each have a plurality of inclined surfaces formed thereon, one for each of the rollers, with corresponding inclined surfaces on the thrust rings being



equidistant one from the other and serving as mounting surfaces between which a respective one of the rollers is radially and axially fixed. The inclined surfaces are oriented to be perpendicular to the axis of its respective roller and inclined to the axis of rotation defined by the spindle. As a result, each roller is inclined at a predetermined angle to the axis of rotation defined by the spindle.

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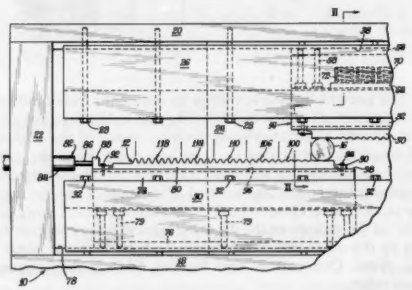
**3,818,736**
**TOOTH FORMING MACHINE**
**Donald E. Blue, Decatur, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.**
**Filed Oct. 10, 1972, Ser. No. 296,280**
**Int. Cl. B21h** *5/00*
**U.S. Cl. 72—88** **5 Claims**

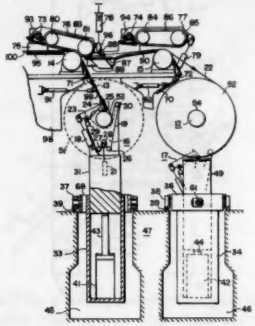


A tooth forming machine provides an improved method of rolling a plurality of teeth on a rotatably supported cylindrical workpiece. The machine includes a tooth forming die on rack mounted on the powered member in tangential tooth forming relation with the periphery of the workpiece and provides a stepped series of multi-toothed, uniformly profiled forming sections which afford gradually decreasing penetration levels into the workpiece. The rack is movably supported by a machine slide assembly including a plurality of springbiased bearing plates for maintaining alignment of the rack.

## 3,818,737
## STRIP-TAKE-UP APPARATUS

Toshiyuki Kajiwara; Hidetoshi Nishi, and Noriyoshi Sonobe, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 10, 1972, Ser. No. 296,024
Claims priority, application Japan, Oct. 11, 1971, 46-79469
Int. Cl. B21c *47/00*
U.S. Cl. 72—134 20 Claims

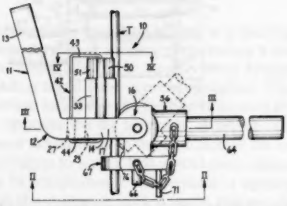


This invention concerns with an apparatus for taking up strips as of metal into a coil or roll. The strip take-up apparatus is characterized in that the apparatus comprises the following elements: a plurality of strip deflector devices, a plurality of take-up devices arranged downstream of the respective deflector devices along the direction of running of the strip, a strip guide device for making a wind-up angle at the leading end of the sheared strip, a belt wrapper device for facilitating the wind up of the strip on the take-up device, a support device to which the belt wrapper device is fixed, a first device for shifting the support device and the belt wrapper device to the downstream of the take-up device, a second device adapted to drive the shifted devices sideward, and a carrier device for carrying out the wound up coil from the take-up device.

## 3,818,738
## TUBE BENDER

James A. Okamuro, Kalamazoo, Mich., assignor to Borroughs Tool & Equipment Corporation, Kalamazoo, Mich.

Filed Apr. 23, 1973, Ser. No. 353,582
Int. Cl. B21d *7/04*
U.S. Cl. 72—149 10 Claims

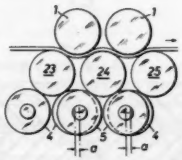


A portable tube bending device having a base member and a first die member which has at least one tube receiving die recess therein and which is mounted for longitudinal movement along its axis during a tube bending operation. A handle is connected to a second die member which has a curved surface and a tube receiving recess in the curved surface therein and is adapted to cooperate with the first die member by being pivotable with respect thereto. A tube gripping device is secured to the second die member and engages a portion of the tube spaced longitudinally along the axis of the tube from the location where the first and second die members engage one another to facilitate a bending of the tube when the handle is moved relative to the base member. The tube gripping device is secured to the second die member by an elongated chain so that the tube gripping device will always remain connected with the pivotal die member. A notch is provided in the second die member and is adapted to receive a tube fitting therein to facilitate a bending of tubes having the fittings premounted thereon.

## 3,818,739
## APPARATUS FOR STRAIGHTENING METAL STRIPS

Curt Munchbach, Pforzheim-Sonnenberg, and Hans Weber, uber Neuenburg, both of Germany, assignors to Irma Ungerer, Pforzheim, Germany

Continuation of Ser. No. 765,313, Oct. 7, 1968, abandoned.
This application July 26, 1971, Ser. No. 164,841
Claims priority, application Germany, Oct. 27, 1967, 14342
Int. Cl. B21d *1/02*
U.S. Cl. 72—163 2 Claims

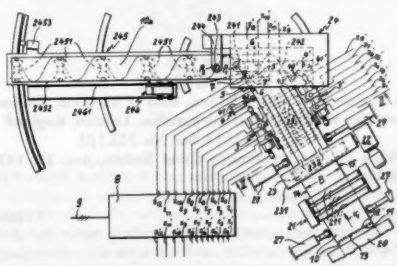


In a machine of the type having upper and lower straightening rolls and support rollers for straightening a metal strip of indeterminate length; the support rollers on which the lower straightening rolls rest, are arranged in a staggered manner so that a group of support rolls which is in engagement with one particular straightening roll does not contact any other straightening roll.

## 3,818,740
## METHOD AND APPARATUS FOR PRODUCING WELDED SPIRAL SEAM PIPE

Hans Gebauer, Herns, Germany, assignor to Hoesch Maschinenfabrik Deutschland AG, Dortmund, Germany

Filed Dec. 6, 1972, Ser. No. 312,729
Claims priority, application Germany, Dec. 9, 1971, 2161105
Int. Cl. B21b *1/00*, B23k *1/20*
U.S. Cl. 72—203 17 Claims



In shaping the lateral edges of an elongated flat section, such as a metal or plastic strip or plate, whether with or

without a cover layer or coating, preparatory to welding them in a pipe molding mill for forming spiral seam pipings, the edges are machined, for example, with a cutting torch, to provide a pair of bevels on each edge. The beveled portions of the lateral edges intersect in an outwardly projecting apex spaced from each of the surfaces defining the opposite faces of the section. On the opposite lateral edges the apices are offset relative to one another so that an overlapped arrangement is provided when the opposite edges are positioned for the spiral seam welding operation.

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**3,818,741**

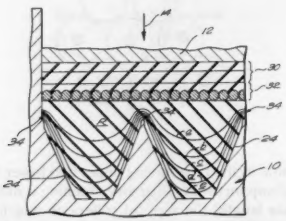
## POWER TRANSMISSION BELT AND METHOD OF MAKING

**Hugh D. Terhune, Dover, N.J., assignor to The Goodyear Tire and Rubber Company, Akron, Ohio**

**Filed Nov. 16, 1972, Ser. No. 307,025**

**Int. Cl. F16g** *5/16*; **B22b** *5/12*; **B32b** *63/00*

**U.S. Cl. 74—233** **12 Claims**



A power transmission belt and method of making the same of the type having longitudinal ribs that run in grooved pulleys which comprises a tension carrying section and a compression section, characterized by having a sheet member made up of one or more plies selected from a woven fabric, a rubberized bias fabric, a fabric composed of a fiber reinforced film of rubber and the like, hung in a catenary suspension within the compression section of the belt.

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**3,818,742**

## ROLLING MILLS

**Jack Maltby, and Dennis Stubbs, both of Sheffield, England, assignors to British Steel Corporation, London, England**

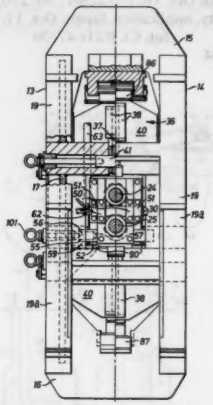
**Filed Jan. 9, 1973, Ser. No. 322,123**

**Claims priority, application Great Britain, Jan. 27, 1972, 3888/72**

**Int. Cl. B21b** *31/08, 31/00*

**U.S. Cl. 72—238** **7 Claims**

A four-high rolling mill stand for rolling metal bar stock. The work rolls are carried in work roll arms pivotally mounted to one another about a pivot axis and forming a mill sub-assembly. An adjusting device is provided for adjusting the effective position of the pivot axis relative to one of the work roll arms. The sub-assembly is removably mounted to the frame by a pin passing through a bore in the frame and a bore in the sub-assembly. The support or back-up rolls are rotatably mounted in the frame, the axis of rotation of the support rolls being movable with respect to the frame for alignment to support rolls on their associated work rolls.



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**3,818,743**

## ROLLING MILLS

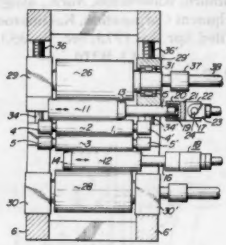
**Toshiyuki Kajiwara; Noriyoshi Sonobe; Hidetoshi Nishi, and Masahiro Hayashi, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Continuation-in-part of Ser. No. 224,550, Feb. 8, 1972, abandoned. This application June 11, 1973, Ser. No. 368,521**

**Claims priority, application Japan, Feb. 15, 1971, 46-6143; Aug. 4, 1971, 46-58324**

**Int. Cl. B21b** *31/18*

**U.S. Cl. 72—243** **15 Claims**

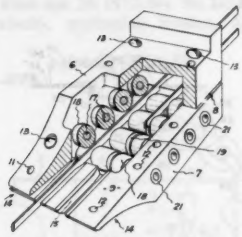


A rolling mill in which a pair of upper and lower intermediate rolls which are shiftable in the axial direction according to the width of a material to be rolled are interposed between a pair of upper and lower work rolls and a pair of upper and lower backup rolls, and the flatness of the rolled material is controlled by the combined effects of the adjustably axially shifted intermediate rolls and the roll bending action.

## 3,818,744
## METHOD OF, AND ENTRY-GUIDE FOR, FEEDING STOCK TO A ROD-ROLLING REDUCTION MILL

Raymond Oliver Sayer, Townsville, Queensland, Australia, assignor to Copper Refineries Pty. Limited, Townsville, Queensland, Australia

Filed Nov. 14, 1972, Ser. No. 306,409
Claims priority, application Australia, Nov. 18, 1971, 7077/71
Int. Cl. B21b *39/14*
U.S. Cl. 72—250 6 Claims

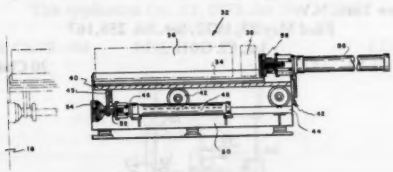


A roll stand for a rolling mill for changing the shape of an ingot or wirebar into a rod or wire which has rollers to guide the stock at its point of entry. Each roller preferably has two circumferential grooves in it so that a first stock piece moving through one groove will set the correct speed of the roller for a second piece of stock moving through the other groove. A method of practicing the invention is also disclosed.

## 3,818,745
## METHOD AND APPARATUS FOR LOADING WORKPIECES IN A PRESS

Kurt Pollak, Havertown, and Raymond F. Boshold, Springfield, both of Pa., assignors to Wean United, Inc., Pittsburgh, Pa.

Filed May 15, 1973, Ser. No. 360,483
Int. Cl. B21c *33/00*
U.S. Cl. 72—270 4 Claims



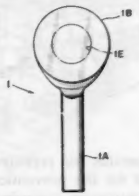
The disclosure of this invention relates to a loading system for an extrusion, forging or shaping press having a number of workpiece containers adapted to be selectively brought into a workpiece loading station and a pressing station. The system includes a carriage located in the loading station on the side of the container opposite the die assembly. A piston cylinder assembly advances the carriage in the direction of the container in the loading station to assure that a workpiece supported by a carriage can be transferred to the workpiece opening of the container while the container itself is in the process of moving axially of the central axis of pressing, for example, when the container in the pressing station is moving away from the die assembly upon completion of the pressing operation to effect a shearing or stripping of the pressed workpiece.

The production rate of a given press, for example, an extrusion press having a number of containers that are selectively positionable in several stations during the extrusion operation, is to a large extent dependent on the time required to perform the many operations of the entire extrusion cycle, such as the cleaning and preparation of the used container, lubrication, and the loading of a billet and dummy block in a previously prepared container.

## 3,818,746
## ROD END COLD FORMING PROCESS

Keiichi Fujita, Gifu, Japan, assignor to Kabushiki-Kaisha Tokai-Rika-Denki-Seisakusho, Nishibiwaji-ma-Cho, Nishikasugai-Gun, Aichi-Pref., Japan

Filed July 5, 1972, Ser. No. 269,079
Claims priority, application Japan, July 6, 1971, 46-49809
Int. Cl. B21j *5/00*
U.S. Cl. 72—356 1 Claim

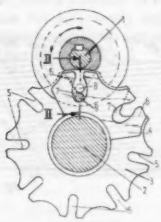


Method for forming a rod end having a rod portion and a substantially flat head portion formed at one end of said rod portion, the method comprising a cold forging process including a upsetting step for forming a pair of parallel flat surfaces of small area on parts of said head portion, and a finishing die forming step for forming the head portion into a desired shape.

## 3,818,747
## DRIVING MECHANISMS HAVING MULTIPLE MALTESE DRIVING GEAR

Gerardus Andriaan Van Riemsdijk, Nijmegen, Netherlands, assignor to Smit Nijmegen Electrotechnische Fabrieken, Nijmegen, Netherlands

Filed Dec. 5, 1972, Ser. No. 312,260
Claims priority, application Netherlands, Dec. 15, 1971, 7117177
Int. Cl. F16h *55/04*
U.S. Cl. 74—436 2 Claims

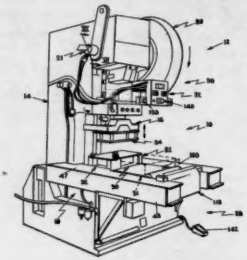


A multiple maltese driving mechanism for the conversion of the continuous rotation of a driving shaft into the stepwise movement of a body, said mechanism comprising a plurality of toothed members fixed to said body and a plurality of driving pins fixed to said driving shaft, said pins being adapted to cooperate in pairs with pairs of said members for special steps of said body and during such steps to drive said body by turns and to keep together said body positively coupled with said driving shaft.

## 3,818,748
## SAFETY APPARATUS FOR PRESSES

Henry Smit, Kentwood, Mich., assignor to Leslie E. Tassell, Grand Rapids, Mich., a part interest

Filed June 15, 1972, Ser. No. 263,147
Int. Cl. B21j 13/00
U.S. Cl. 72—448 24 Claims

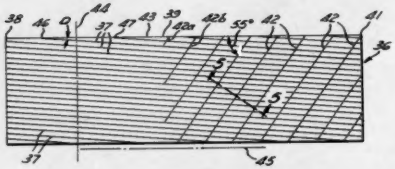


A safety press apparatus for repeated operation at full production speed and for the prevention of injuries to an operator thereof. The apparatus comprises a traveling bolster assembly incorporated on a power press. The bolster assembly includes a bolster plate movable between an operative position beneath said press ram and a control and loading station spaced sufficiently from the ram of said press to prevent injury to any part of the operator. A safety control feature prevents operation of the press until the bolster is in its operative position and automatically returns the bolster to its inoperative position if its movement is obstructed. In one embodiment, the assembly includes restraining means for automatically restraining pressure pins used in conjunction with drawing dies except when the bolster is in its operative position.

## 3,818,749
## THREAD ROLLING DIES AND METHOD OF MANUFACTURING SAME

Herbert L. Yankee, North Royalton, and Richard H. Corrette, Olmsted Falls, both of Ohio, assignors to NL Industries Inc., New York, N.Y.

Filed Oct. 2, 1972, Ser. No. 294,219
Int. Cl. B21h 3/06
U.S. Cl. 72—469 8 Claims

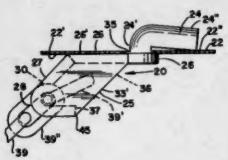


A thread rolling die and a method of manufacturing such die is disclosed for forming self-locking threads having helically arranged arrays of thread form projections. The dies include thread forming convolutions spaced along the length of the die by a distance equal to $\pi$ times the diameter of the blank to be threaded. Projection forming troughs are formed in the die at spaced locations along the length of the die a distance biased upon $\pi$ times the sum of the blank diameter and two times the height of the projections. In the illustrated embodiment wherein three arrays of projections are provided around the thread to be formed, the spacing of the troughs is $\pi$ divided by three times the sum of the blank diameter plus two times the height of the projections. The troughs are formed by a shaped pressing tool which is pressed into the face of the die prior to hardening wherein the spacing is arranged as set forth.

## 3,818,750
## FRAME ANCHOR HOOK DEVICE

Duane C. Ballweber, R.R. No. 3, Wahpeton, N. Dak. 58075

Filed Mar. 9, 1972, Ser. No. 233,230
Int. Cl. B21d 1/12
U.S. Cl. 72—476 2 Claims

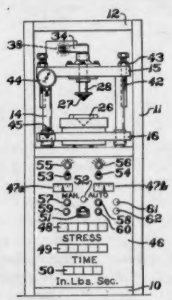


The invention comprises an anchoring device for straightening out automobile frames. The anchoring device has an L-shaped hook mounted to the top of the device for hooking into a bore in the frame. The device has a socket at its lower end for receiving an end of a telescoping jack. The socket also has a slot therein for receiving a link of an anchoring chain. The anchoring device may be employed in pairs by being hooked into bores in the frame on opposite sides of an area of the frame to be straightened out and either the telescoping jack may be placed with its ends in the socket of the devices and are end of the jack telescoped outward to straighten out the frame by spreading the hook devices apart or alternatively anchoring chains may be hooked into the slots in the sockets of each device, and we of the anchoring chains secured and the other pulled away in an opposite direction to spread the anchoring devices apart to straighten out the frame.

## 3,818,751
## TESTING APPARATUS FOR ELASTOMERS

Paul W. Karper, Stow, and John P. Porter, Cuyahoga Falls, both of Ohio, assignors to The B. F. Goodrich Company, New York, N.Y.

Filed May 23, 1972, Ser. No. 256,167
Int. Cl. G01h 3/30
U.S. Cl. 73—15.6 20 Claims




An apparatus for indicating, in numerical form, the stress produced in a sample of an elastomer when subjected to a deformation of predetermined magnitude, a numerical value of the length of time for the stress so produced to decrease to a

predetermined percentage of the maximum, and also a numerical value of the area under the stress-time curve for a predetermined time interval inclusive of the maximum stress. The apparatus preferably includes means to bring the sample to a predetermined temperature prior to subjecting it to the predetermined deformation.

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**3,818,752**

**METHOD AND APPARATUS FOR TESTING TIGHTNESS**

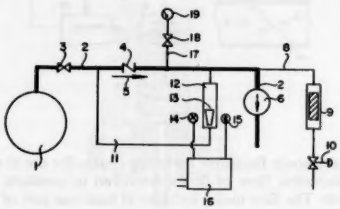
**Nils G. Lindeberg, Kavallerivagen 4, 186 00 Vallentuna, Sweden**

**Filed Apr. 20, 1972, Ser. No. 245,937**

**Claims priority, application Sweden, Apr. 28, 1971, 5509/71**

**Int. Cl. G01m** *3/32*

**U.S. Cl. 73—49.2** **15 Claims**




Method and apparatus for testing the air tightness of an enclosed chamber. A reference pressure is established in a control section isolated from the chamber, after which the chamber and control section are placed in communication with each other, creating an initial flow through a flow restricting valve in the control section. After the pressure difference across this valve falls below a predetermined valve, any further flow that is sensed is indicative of a leak in the chamber.

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**3,818,753**

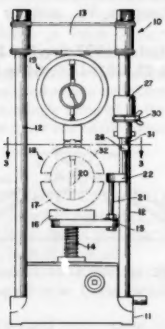
**DEFLECTION TESTER**

**Victor C. Johnson, Jr., 673 Nakoma Dr., Jackson, Miss. 39206**

**Continuation of Ser. No. 75,871, Sept. 28, 1970, abandoned. This application Oct. 12, 1972, Ser. No. 297,001**

**Int. Cl. G01n** *3/08*

**U.S. Cl. 73—94** **1 Claim**




Improvement in apparatus for testing the quality and durability of bituminous paving mixtures comprising a flow measurement device attached to such apparatus and being actuated by means operatively connected to the specimen of bituminous paving mixture being tested.

**3,818,754**

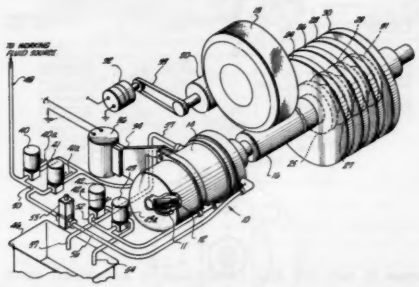
**AUTOMATIC LOAD CONTROL SYSTEM FOR HYDRAULIC ROTARY POWER ABSORBERS**

**Carl Junior Asmus, Temple City, Calif., assignor to Clayton Manufacturing Company, El Monte, Calif.**

**Filed May 4, 1972, Ser. No. 250,331**

**Int. Cl. G01l** *3/20*

**U.S. Cl. 73—134** **37 Claims**



An automatic load control system is described for controlling the retarding force characteristics of a rotary power absorber such as a dynamometer in which the absorbed torque varies with the level of fill of the working fluid. The load control system includes a speed signal generator such as a tachometer coupled to the dynamometer for generating a speed signal representative of the rotational speed. A torque signal generator in the form of a strain gauge or other transducer is connected to the dynamometer to provide a torque signal representative of the absorbed torque. Load and unload control mechanisms such as electrically operated valves are connected between the power absorber and a source and sink for controlling the flow of working fluid into and out of the absorber and thereby the value of the absorbed torque. A flow control means controls the valves in accordance with the values of the speed and/or torque signals to thereby control the level of working fluid within the absorber to cause the absorbed torque to vary in a predetermined manner, e.g., as the square of the speed changes. An adjustable torque means is coupled to the flow control means for adjusting the absorbed torque to a selected value at a given speed. The dynamometer may also be provided with a plurality of flywheels and electrically operated means for selectively engaging one or more flywheels with the absorber rotor to simulate the inertia on an engine or vehicle under test.

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**3,818,755**

**TESTING TIRES**

**Reginald Harold Edwards, and Geoffrey Lloyd Owens, both of c/o Fort Dunlop, Erdington, Birmingham, England**

**Filed Feb. 16, 1973, Ser. No. 333,369**

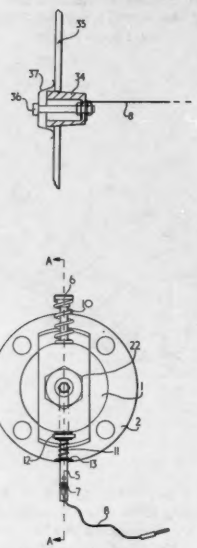
**Claims priority, application Great Britain, Feb. 26, 1972, 8965/72**

**Int. Cl. B21c** *47/00*

**U.S. Cl. 73—146** **16 Claims**

A method for simulating a tire burst in a pneumatic tire comprising preforming a hole in the sidewall of the tire and

plugging the hole with a hollow rubber bung closed at the end only, the closed end being disposed towards the exterior of the



tire. The rubber bung is retained in the hole when the tire is inflated and subequently released from the hole to simulate a tire burst, of which the following is a specification.

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**3,818,756**

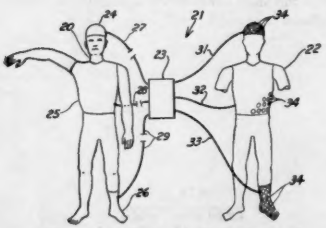
**LOAD PROFILE ANALYZER IN THE ATTACHED SPECIFICATION**

**Edward R. Barron, 20 Ruth Dr., Framingham, Mass. 01701, and Stanley D. Tanenholtz, Southboro, Mass., assignors to said Barron, by said Tanenholtz**

**Filed Sept. 7, 1971, Ser. No. 178,017**

**Int. Cl. A41h 1/00**

**U.S. Cl. 73—172** **21 Claims**



Disclosed is a load profile analyzer for measuring and indicating static and dynamic loads exerted upon different areas of the human body by objects in contact therewith. A plurality of pressure sensors are suspended in predetermined positions with respect to the body by a support and the pressures sensed are indicated by a display.

**3,818,757**

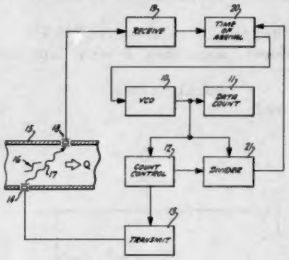
**DUAL PATH ULTRASONIC FLUID FLOW METERING SYSTEM AND METHOD**

**Alvin E. Brown, Redwood, Calif., assignor to Saratoga Systems, Inc., Cupertino, Calif.**

**Filed May 5, 1972, Ser. No. 250,760**

**Int. Cl. G01f 1/00**

**U.S. Cl. 73—194 A** **17 Claims**



An ultrasonic fluid flow metering system for use in monitoring volumetric flow of fluids conveyed in conduits or open channels. The flow meter includes at least one pair of transducers which alternately operate as transmitters and receivers to propagate energy through the flowing medium between the transducers. Pulses are applied to the transducers and the transit time of the pulse energy through the fluid in the two directions is utilized to generate frequencies which give an indication of the fluid flow. The system includes means for generating pulses which are transmitted through the fluid in opposite directions and a voltage controlled oscillator, the output of which is divided and used to provide delayed output pulses. The delayed output pulses are compared in time phase to the received pulses transmitted through the fluid in the conduit or channel and the frequency of the oscillator is controlled to provide time coincidence between the compared pulses. A count of the VCO output pulses over a predetermined period is alternately performed for upstream and downstream transmissions and the difference in the count provides a measure of the fluid flow.

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**3,818,758**

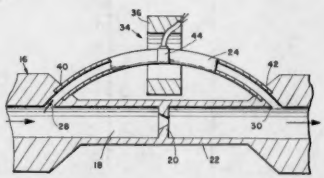
**ELECTRICAL FLOW METER**

**Edmond Easter, Hampton, Va., assignor to Fluid Flow, Inc., Atlanta, Ga.**

**Filed Oct. 6, 1972, Ser. No. 295,479**

**Int. Cl. G01f 1/00; G01p 5/10**

**U.S. Cl. 73—204** **11 Claims**



Fluid flow rate determined by measuring the displacement of distributed electrical resistance along a flow conduit through which fluid is conducted. The flow conduit is heated by current simultaneously induced therein and in a fluid storing tube of the same structural and electrical configuration. The resistances of the flow conduit and the fluid storing tube

form the resistive branches of a balanced bridge circuit through which changes in the resistance distribution are measured.

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**3,818,759**

## DEVICE FOR DISCONTINUOUSLY MEASURING THE LEVEL OF LIQUID METAL SUPPLIED TO A CONTAINER

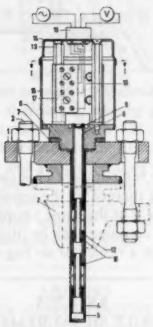
**Dieter Cremer, Steinenbruck, and Rainer Hans, Bensberg, both of Germany, assignors to Interatom Internationale Atomreaktorbau GmbH, Bensberg/Koln, Germany**

**Filed Aug. 31, 1972, Ser. No. 285,310**

**Claims priority, application Germany, Sept. 3, 1971, 7133639[U]**

**Int. Cl. G01f** *23/06*

**U.S. Cl. 73—290 R** **5 Claims**



Exchangable device for discontinuouly measuring the level of liquid metal in a container in accordance with induction principles includes a casing tube insertable into a container adapted to receive liquid metal therein,a casing tube flange tightly connected to the casing tube and tightly connectible to a flange formed on the container, at least one coil core mounted in the casing tube, the coil core being formed of a material selected from the group consisting of soft iron and austenitic iron and steel, at least one primary and one secondary coil mounted on the coil core the primary and secondary coil together forming a measurement sensor, the primary coil being energizable by a constant intermediate frequency alternating current for inducing a monitorable voltage in the secondary coil variable in value in accordance with the absence or presence of liquid metal at the level of the measurement sensor, a spacer tube of given length received in the casing tube and connected at one end thereof to the coil core, and a plug member sealingly secured to the casing tube flange and connected to the other end of the spacer tube.

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**3,818,760**

## LIQUID-CONTENTS GAUGING SYSTEMS

**Anthony Stonham Howard, 3 Springhill, Elstead, Godalming, Surrey, and Ivan Boris David Johnson, 26 Rydes Hill Rd., Guildford, Surrey, both of England**

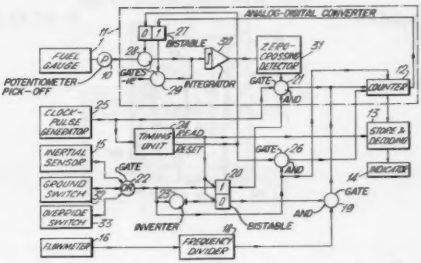
**Filed Nov. 24, 1971, Ser. No. 201,645**

**Claims priority, application Great Britain, Nov. 25, 1970, 56079/70**

**Int. Cl. G01f** *23/26*; **G06f** *15/50*

**U.S. Cl. 73—291** **9 Claims**

An aircraft fuel-gauging system includes a counter that is repeatedly reset and then pulsed to a count appropriate to a continuous measurement of fuel-mass provided by a capacitance gauge. The pulsing and resetting operations of the counter are interrupted whenever an inertial sensor detects change in aircraft attitude or speed in excess of a predetermined threshold value for which there is inertial error in the capacitance-gauge measurement, and the count retained in the counter at the commencement of the period of interruption is up-dated continuously through that period by pulse signals supplied by one




or more flowmeters in accordance with the rate of mass-change in fuel content. Two switches for overriding the interruption of the pulsing and resetting operations are provided, one for operation while the aircraft is on the ground and the other whenever desired by the aircrew.

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**3,818,761**

## SYSTEM FOR MEASURING TEMPERATURES

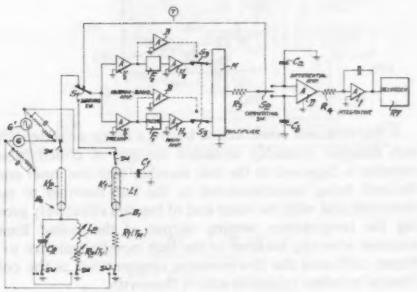
**Heinz Brixy, and Klaus-Jurgen Gartner, both of Julich, Germany, assignors to Kernforschungsanlage Julich GmbH, Julich, Germany**

**Filed Mar. 28, 1972, Ser. No. 238,833**

**Claims priority, application Germany, Mar. 29, 1971, 2115029**

**Int. Cl. G01k** *7/30*

**U.S. Cl. 73—359** **10 Claims**



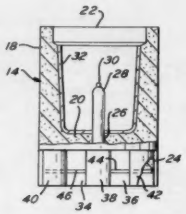
A system for measuring temperatures using the thermal-noise electrical output of a conductive element in which a reference resistor and the conductive element are connected by a sampling switch arrangement to an amplifier provided with a filter whose band width or characteristic pass frequency corresponds to the noise-voltage frequency. The output of the latter is applied to a multiplier and the latter supplies the output stage via a commutating switch synchronized with the sampling switch.

3,818,762

## PHASE CHANGE DETECTOR CUP

Max H. Kraus, Montgomery County; Michael P. Baccellieri, Philadelphia, both of Pa., and Bruce McClintock, Williamstown, N.J., assignors to Electro-Nite Co., Philadelphia, Pa.

Filed Apr. 5, 1972, Ser. No. 241,178
Int. Cl. G01k 1/06; G01n 25/06
U.S. Cl. 73—359 6 Claims




The thermocouple support post in a phase change cup is made from or coated with a high alumina content refractory coating having an annealing point at approximately the solidus arrest temprature of molten metal so that the refractory is sufficiently plastic to accommodate forces resulting from shrinkage of the molten metal as it cools.

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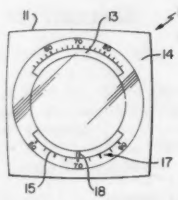
3,818,763

## THERMOMETER CONSTRUCTION AND METHOD OF MAKING THE SAME

Walter J. Berleyoung, Knoxville, and Jay L. Lewis, Concord, both of Tenn., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Nov. 20, 1972, Ser. No. 307,958
Int. Cl. G01k 5/50
U.S. Cl. 73—363.7 18 Claims




A thermometer construction having a frame provided with a hub member rotatably mounted thereto. A coiled bimetal member is disposed on the hub member with the inner end of the coil being interconnected to the hub member to move therewith and with the outer end of the coil effectively providing the temperature sensing output of the coiled bimetal member whereby rotation of the hub member relative to the frame calibrates the thermometer construction as the coiled bimetal member rotates in unison therewith.

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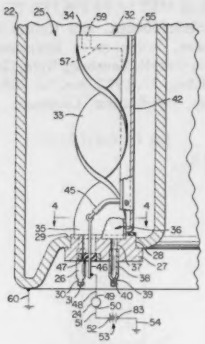
3,818,764

## PRESSURE SENSING MEANS AND METHOD FOR A PRESSURIZED CONTAINER MEANS AND SYSTEM UTILIZING THE SAME

Joseph P. Wagner, Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Jan. 8, 1973, Ser. No. 322,071
Int. Cl. G01l 19/04
U.S. Cl. 73—393 16 Claims

A container having a pressurized fluid therein and a pressure sensing fluid operated device carried by the container for sensing pressure changes within the container. The sensing device is initially charged to same pressure level as the container and is disposed within the container so as to be substantially surrounded by the fluid therein and is thereby temperature compensated whereby pressure changes of the fluid in the




container caused by temperature changes thereof are ineffective to cause sensing thereof by the sensing device as the fluid of the sensing device is at the same temperature as the fluid in the container. Such container can be utilized as the fluid pressure supply means for a vehicular air bag safety device.

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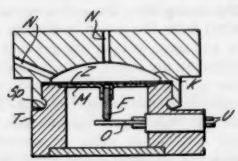
3,818,765

## DEVICE FOR STERILE MEASUREMENT OF LIQUID OR GAS PRESSURES

Odd Eriksen, Jar, Norway, assignor to Sentralinstitutt For Industriell Forskning, Oslo, Norway

Filed Feb. 16, 1972, Ser. No. 226,802
Claims priority, application Norway, Feb. 17, 1971, 575/71
Int. Cl. G01l 7/08
U.S. Cl. 73—395 1 Claim

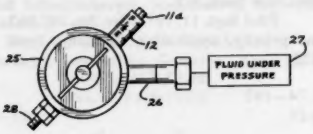



The present invention relates to a pressure measuring device, particularly for sterile medical pressure measurements, and which comprises a pressure sensor with a pressure sensitive membrane and a pressure chamber connectable to the liquid and gas circuit in which the pressure is to be measured, and operative to transfer said liquid and gas pressure to the pressure sensitive membrane. The improvement according to the invention comprises the feature that an impervious isolation membrane of significantly less rigidity than the pressure sensitive membrane is disposed between the latter membrane and the pressure chamber, in order to isolate the sensor from the medium in which the pressure measurements is to be performed. This feature according to the invention substantially facilitates the sterilization procedure for such pressure measuring device without disturbing the measurements, and in addition preferably provides electric insulation between said liquid or gas circuit and the pressure sensor.

## 3,818,766
## LIQUID MANOMETER

Joseph F. Fleischhacker, Minnetonka, and Lindsay A. Wallace, Minneapolis, both of Minn., assignors to Tescom Corporation, Minneapolis, Minn.

Filed Oct. 25, 1972, Ser. No. 300,786
Int. Cl. G01l 7/08
U.S. Cl. 73—406 4 Claims




A liquid manometer or pressure indicator having a housing with spaced indicia thereon, a sensing gland joined to the housing and having a chamber for liquid opening to the housing bore, a metal disk secured to the gland end surface that is opposite the housing and a rod extending within said chamber and bore, and a pressure regulator having the housing threadedly connected thereto. In the second embodiment the housing bore is tapered while in the third embodiment the housing bore is of a stepped construction.

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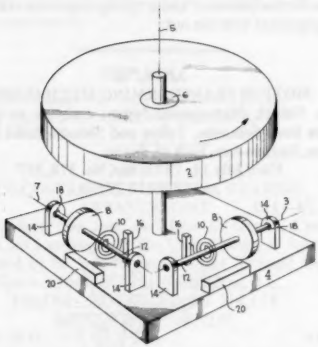
## 3,818,767
## PASSIVE DUAL-SPIN MISALIGNMENT COMPENSATORS

James H. Donohue, Ellicott City, and Benjamin G. Zimmerman, Forest Heights, both of Md., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sept. 29, 1972, Ser. No. 293,739
Int. Cl. G01c 19/02
U.S. Cl. 74—5.5 5 Claims

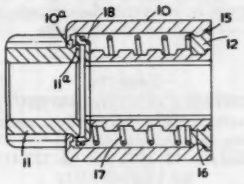


In combination with a "dual-spin" gyroscopically stabilized device having a spinning rotor and a non-spinning platform two substantially lossless mechanical resonators, resonant at the spin frequency, are orthogonally disposed on the platform for compensation for the disturbing torque acting on the platform due to rotor misalignment.

## 3,818,768
## NUT AND GEAR ASSEMBLIES FOR USE IN ENGINE STARTER MOTORS

William Arthur Hardy, Birmingham, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Feb. 9, 1972, Ser. No. 224,678
Claims priority, application Great Britain, Feb. 10, 1971, 4347/71
Int. Cl. F02m 15/06; B21k 25/00
U.S. Cl. 74—6 3 Claims




A nut and gear assembly for a vehicle starter motor, in which the gear is secured to one end of a body and the nut is secured to the other end. The nut has a peripheral groove portion and a series of flanges projecting radially beyond the groove and is secured in the body by forcing the flanges into the body until part of the material of the body is displaced into the groove.

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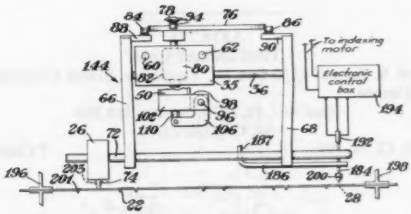
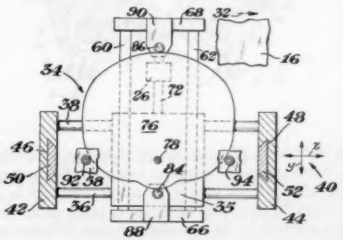
## 3,818,769
## APPARATUS FOR REPEATED TRACING VARIOUS PATTERNS

Ruben A. Tigner, Bay City, and Lewis S. Mounts, Midland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 873,494, Nov. 3, 1969, abandoned.
This application Oct. 30, 1972, Ser. No. 302,234
Int. Cl. F16h 25/08
U.S. Cl. 74—55 13 Claims



Apparatus capable of repeatedly tracing a programmed path at constant velocity, and useful as glue applicator, cutting

or welding assemblage, and the like. Such apparatus can comprise, as an example, an X-Y table (see FIG. 4) including a platform 35 slidable on a first pair of rods 36 and 38 for reverse movement in the X diretion, and a second pair of rods 60 and 62 slidably carried by platform 35 for reverse movement in the Y direction. A cam 76 is rotatably fixed to 76 35 and operates through cam followers to reversibly drive platform 35 and rods 60 and 62 such that a mounting shaft 72 fixed the latter, moves with a direction and velocity comprising the vector sum of the movements of platform 35 and rods 60 and 62. Shaft 72, on which multiple glue applicator heads 26 or the like can be mounted, thereby repeatedly traces a certain path P dependent on cam 76 profile.

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**3,818,770**

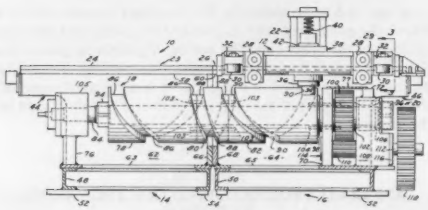
**ADJUSTABLE LENGTH CAM SHUTTLE**

**Robert W. Sievers, St. Clair Shores, Mich., assignor to Motion Manufacturing, Inc., Detroit, Mich.**

**Filed Feb. 18, 1972, Ser. No. 227,415**

**Int. Cl. F16h** *25/12*

**U.S. Cl. 74—57** **24 Claims**



A shuttle with a table reciprocated by a cylindrical cam drive assembly carried by bed sections. The cam drive assembly has at least two and preferably three cam sections, to provide varying lengths and rate of travel for reciprocating the table by changing one of the cam sections and inserting an extension between the bed sections to carry the table for reciprocation.

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**3,818,771**

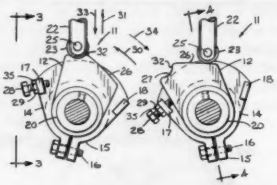
**TIME-DELAY CAM**

**Jack R. Kobelt, 6110 Oak St., Vancouver, British Columbia, Canada**

**Filed Nov. 29, 1972, Ser. No. 310,355**

**Int. Cl. F16h** *21/44*

**U.S. Cl. 74—99** **7 Claims**



This disclosure pertains to novel means whereby a cam pauses momentarily with respect to a pivotally oscillating cam shaft upon which the cam is mounted. The cam is pivotally mounted on the cam shaft in operative relationship with a cam actuator secured to the cam shaft. A cam follower maintains the cam in a fixed position as the cam shaft and cam actuator pivot in one direction through a predetermined angle, the cam actuator ultimately contacting and impelling the cam in the same pivotal direction. Oscillation of the cam shaft in the opposite pivotal direction impells the cam in the same direction until the cam again becomes pivotally fixed by the cam follower.

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**3,818,772**

**ARRANGEMENT IN A RECORD PLAYER FOR ACCURATELY ADJUSTING THE HEIGHT OF A FRICTION WHEEL**

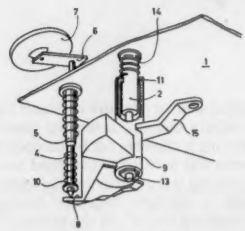
**Kurt Eisemann, Berlin, Germany, assignor to U.S. Philips Corporation, New York, N.Y.**

**Filed Sept. 11, 1972, Ser. No. 287,967**

**Claims priority, application Germany, Sept. 15, 1971, 21461223**

**Int. Cl. F16h** *27/44*

**U.S. Cl. 74—107** **3 Claims**



The present invention is directed to a record player having a chassis, a turntable carried on the chassis and a stepped drive shaft driven by a friction wheel. The contact position of the wheel with the shaft determines the different speeds for operating the turntable. Mechanism is provided for accurately adjusting the vertical position of the friction wheel with respect to the steps of the drive shaft. A bolt having a threaded end is carried on the chassis and a shift element is displaceably carried on the bolt for accurately adjusting the height of the friction wheel. The shift element has a step cam surface and the wheel is supported by a support cooperating with the cam surface so that as the shift element is rotated the height of the friction wheel will vary so as to change the operating speeds of the turntable. A nut is carried on a threaded end of the bolt so as to accurately determine the vertical position of the shift element for fine adjustment and a spring urges the shift element into engagement with the nut.

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**3,818,773**

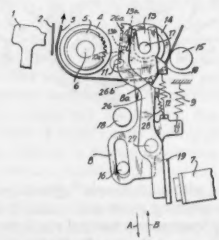
**MOTION TRANSFORMING MECHANISM**

**Machito Natori, Matsumoto, Japan, assignor to Kabushiki Kaisha Suua Seikosha, Tokyo and Shinshu Seiki Kabushiki Kaisha, Nagano-ken, both of, Japan**

**Filed July 11, 1973, Ser. No. 378,357**

**Int. Cl. F16h** *27/00*

**U.S. Cl. 74—112** **7 Claims**



A motion-transformer suitable for use with a small printing machine utilizes a trigger mechanism in combination with a

rotating drum and slidable members to convert the rotation of the drum into linear motion. The linear motion provides for intermittent advancement of paper on which printing is to be carried out.

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**3,818,774**

**CONTROL DEVICE FOR SHIFTING BRUSH BODY CARRIERS ON BRUSH MANUFACTURING MACHINES**

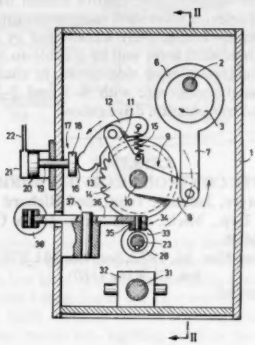
**Emil Schnekenburger, Bahnhofstr. 5a, 7867 Zell/Wiesental, and Rudolf Schnekenburger, Sonnholde 4, 7868 Todtnau, both of Germany**

**Filed Apr. 23, 1973, Ser. No. 353,714**

**Claims priority, application Germany, Apr. 22, 1972, 2219935**

**Int. Cl. F16h** *29/00*

**U.S. Cl. 74—125** **12 Claims**



A control device for shifting brush body carriers on brush manufacturing machines, particularly for brush boring and/or brush filling machines, with a pawl mechanism, wherewith a pivoted pawl lever, moved by an eccentric drive, is caused by a control-tape operated actuating element to engage a ratchet wheel which initiates the shifting of the brush body by actuating a drive mechanism.

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**ERRATA**

For Classes 74—233 and 74—436 see:
Patents Nos. 3,818,741 and 3,818,747

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**3,818,775**

**CONCENTRIC DIFFERENTIAL GEARING ARRANGEMENT**

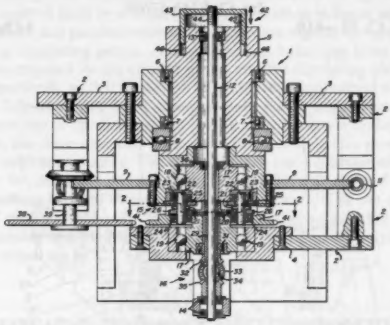
**Robert J. Zeiger, San Jose, and John C. Gerdts, Campbell, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.**

**Filed Nov. 29, 1972, Ser. No. 310,615**

**Int. Cl. F16h** *37/08, 1/38*

**U.S. Cl. 74—675** **6 Claims**

Two input members and two concentric rotatable output members are interconnected by a planetary gear arrangement. The first input drives directly the first output. The second input engages a carrier having the planetary gears affixed thereto. Rotation of the carriage causes rotation of the central sun gear of the planetary gear system. The sun gear is journaled to the carriage and is drivingly connected to the second output through a direction reversing set of bevel gears. The first input drive member includes a ring gear drivingly connected to the planetary gears for driving the second output member in the same direction and by the same amount as the first output member. Motion of the first input results in equal motion of the two outputs while input motion of the second input results in movement of the second output relative to the first output. This device is useful where non-interacting two-axis control of remote gimbaled systems is required.



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**3,818,776**

**GEAR CHANGING MEANS FOR CHANGE-SPEED GEARBOXES**

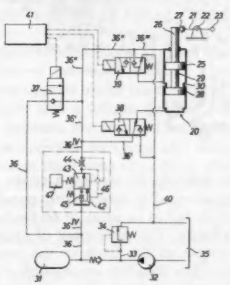
**Karl Prenzel, Neu-Katzwang, and Hans Barthel, Nurnberg, both of Germany, assignors to Ardie-Werke GmbH, Nurnberg, Germany**

**Filed June 12, 1972, Ser. No. 261,599**

**Claims priority, application Germany, July 23, 1971, 2136960**

**Int. Cl. F16h** *3/08, 17/00*

**U.S. Cl. 74—364** **10 Claims**



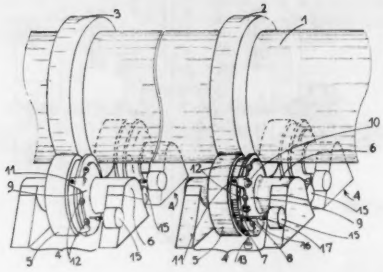
A means is provided for semi-automatically or automatically making gear changes in a multi-ratio change-speed gearbox having mechanical synchronization for motor vehicles and the like comprising a fluid actuated cylinder for moving the movable parts of the gearbox to effect speed change, a source of fluid under pressure, an electromagnetic control valve for directing fluid into the cylinder chambers, means for restricting the speed of flow and means for restricting the pressure on the fluid fed to the control valve and chamber.

3,818,777

**SUPPORTS FOR LARGE DIAMETER DRUMS AND DRIVE MEANS TO ROTATE THE DRUMS**

**Gerard Pere, Le Breuil, France, assignor to Creusot-Loire, Paris, France**

**Filed May 4, 1973, Ser. No. 357,175**
**Int. Cl. F16h** *57/00*
**U.S. Cl. 74—410** **4 Claims**



Apparatus for supporting and driving a body provided with an annular running band, the apparatus including a support carrying a cylindrical roller engaged by the band, means to self-align the roller axis relative to the band axis, a toothed ring to drive the roller, a pinion to drive the ring and drive means for the pinion.

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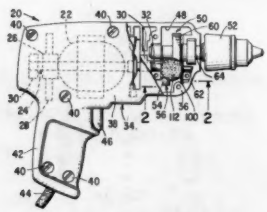
3,818,778

**TEMPORARY STORAGE APPARATUS**

**Philip C. Warner, Sharon, Mass., assignor to The Singer Company, New York, N.Y.**

**Filed July 12, 1973, Ser. No. 378,717**
**Int. Cl. G11c** *11/40*
**U.S. Cl. 340—173 R** **5 Claims**



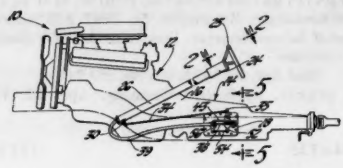
Apparatus for temporarily storing a series of five 12-bit words which are received in series word, parallel bit format. The data bits are stored in an array of 60 latches arranged in 12 rows by 5 columns. The data input of each latch is connected to the output of the latch in the same row in the preceding column. The data bits are applied at the data input of the latches in the first column. The outputs of each stage of a 5-stage shift register are connected in reverse order from last to first to the clock inputs of all the latches of each column in succession from first to last. The 12 bits of a word are passed along the 12 rows of latches and become stored in the latches of the column of highest order in the succession not having data bits already stored therein by a change in the level at the clock inputs to the latches of that column caused by triggering of the stage of the shift register connected thereto. During the presence of each of the five words the next untriggered stage of the shift register in succession is triggered so that after receipt of five words the array of latches contain all the bits of the five 12-bit words of the series.

3,818,779

**MANUAL TRANSMISSION SHIFT CONTROL**

**John W. Skelley, 923 Canterbury St., Saginaw, Mich. 48603**

**Filed May 3, 1973, Ser. No. 356,725**
**Int. Cl. G05g** *9/12*
**U.S. Cl. 74—473 R** **5 Claims**



A manual transmission shift control system wherein rotational and axial selector lever shift movements through a typical "H" pattern are respectively transmitted by a shift tube with a single lower shift lever and by a cable to a relay lever mounted on the transmission side cover, to cause the relay lever to alternately cooperate with R–1 and 2–3 levers for selecting desired transmission drive ratios.

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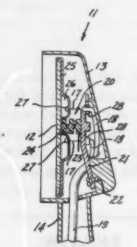
3,818,780

**REMOTE CONTROL REARVIEW MIRROR**

**Matthew McIntyre, Jackson, Tenn., and Richard M. Hadley, Farmington Twp., Mich., assignors to Jervis Corporation, Grandville, Mich.**

**Filed Mar. 16, 1973, Ser. No. 341,870**
**Int. Cl. F16c** *1/10*
**U.S. Cl. 74—501 M** **5 Claims**



An improved remote control connection for rearview mirrors for automobiles and like operable devices in translation using force vectors into universal movement and including a resin element at the mirror end in one-piece form connecting the mirror glass to a mirror support and providing limited hinge-like universal movement therebetween and resisting rotational movement in planes transverse to the central axis through the mirror glass.

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3,818,781

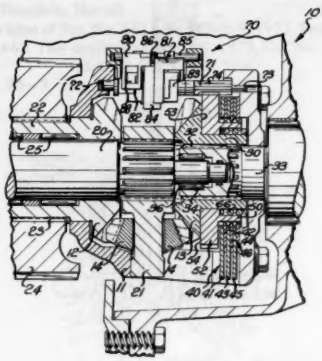
**DIFFERENTIAL GEAR MECHANISM**

**Edward J. Goscenski, Jr., Battle Creek, Mich., assignor to Eaton Corporation, Cleveland, Ohio**

**Filed Jan. 2, 1973, Ser. No. 320,440**
**Int. Cl. F16h** *1/44*; **F16d** *13/04*
**U.S. Cl. 74—711** **11 Claims**

A differential mechanism comprises a differential gear means including an input gear and a pair of output gears. A locking mechanism locks up the differential in response to a predetermined amount of differentiating action occurring.

The locking mechanism functions to lock one of the output gears to the case of the differential. An actuator mechanism is provided for actuating the locking mechanism to effect the lockup of the differential gear means. The actuator mechanism includes a member which rotates during normal differentiating action and a latch member for preventing rotation of the member upon the differentiating action reaching a predetermined magnitude. A cam member rotates with the



rotatable member and operates on the latch member to hold the latch member out of latching position when differentiating action is at a low level. If the differentiating action increases to a predetermined magnitude, the cam member is incapable of holding the latch member out of latching position, and the latch member moves into latching position to engage a latch portion on the rotating member so as to prevent further rotation thereof. This prevention of further rotation of the member effects lockup of the differential.

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**3,818,782**

**APPARATUS FOR CONTROLLING THE SPEED OF A TRANSMISSION WITH BALANCING MEANS FOR A FLUID REGULATOR VALVE**

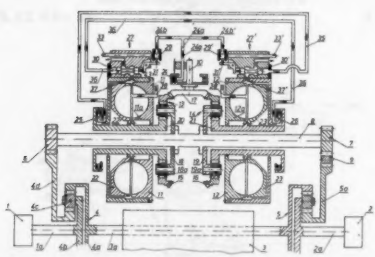
**Waldemar Armasow, Heidenheim, Germany, assignor to Voith Getriebe KG, Heidenheim, Germany**

**Filed May 10, 1973, Ser. No. 359,028**

**Claims priority, application Germany, May 16, 1972, 2223745**

**Int. Cl. F16h** *37/08*

**U.S. Cl. 74—720.5** **13 Claims**



For driving the two tracks of a track laying vehicle at different speeds in a curve, left and right drive elements are connected by differential transmissions with a drive shaft and with a control shaft which is connected by other differential transmissions with the rotors of fluid brake devices, and with another drive shaft. The brake devices are only effective when filled with fluid under the control of a regulating valve piston. First sensing means measure the speed of the drive shaft means and produce first fluid pressure signals for operating a control piston. Second sensing means measure the speed of the control shaft or of a part connected thereto in linear speed relation, and produce second fluid pressure signals for operating a regulating piston. A double-armed balancing lever has arms engaged by the control piston and the regulating piston, respectively, so that a position of equilibrium is obtained when the left and right drive elements rotate at a desired speed. When one of the brake devices is filled and exerts a brake action, the drive elements rotate at a different speed for moving the vehicle in a curve. The control piston has a cylinder which can be manually moved along the respective arm of the balancing lever to change the effective lever arm of the control piston in accordance with the desired speed so that the balancing lever is displaced until the desired speed becomes the actual speed.

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**3,818,783**

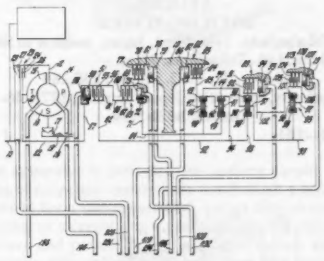
**MANUAL AND AUTOMATIC SHIFT CONTROLS FOR TRANSMISSIONS**

**Allan S. Norris, and James T. Craig, both of Indianapolis, Ind., assignors to General Motors Corporation, Detroit, Mich.**

**Filed Dec. 4, 1972, Ser. No. 311,936**

**Int. Cl. B60k** *21/12*; **F16d** *67/04*

**U.S. Cl. 74—869** **16 Claims**



In a multiratio transmission providing a low ratio drive and a plurality of higher ratio drives having a manual selector control to select the low ratio drive or automatic control of the plurality of higher automatically controlled ratio drives. On manual selection of automatic control, a plurality of automatic shift valves operate under the control of an output speed governor pressure and a torque demand pressure for automatic shifting between the low and high automatically controlled ratios in response to speed and torque demand. On manual selection of the lowest ratio drive, after the automatic control is in the lower or first automatic ratio drive, a selector valve pressure will be supplied by a low signal valve, if both the inverted modulator pressure is high, indicating less than 15% throttle advance and the governor pressure is low indicating low vehicle speed. The predetermined low throttle advance and low speed at which a manual shift to low may be made is independently controlled and adjusted by independently adjustable springs.

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**3,818,784**

**CHANGEABLE TIP TWEEZERS AND THE LIKE**

**Edgar M. McClure, Roanake, Va., assignor to Scientific Components Inc., Roanoke, Va.**

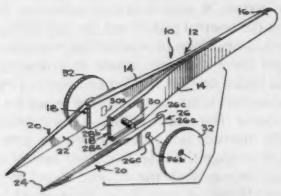
**Filed Jan. 3, 1973, Ser. No. 320,817**

**Int. Cl. B25b** *9/02*

**U.S. Cl. 81—43** **9 Claims**

Changeable tip tweezers formed of a handle portion having a pair of resilient arms extending in a V-shaped path from a

heel end and terminating in outwardly opening channel recesses, receiving substantially wedge shaped mounting formations on the rear ends of changeable tips. The surfaces of the mounting formations are engaged and positioned by con-



fronting surfaces of the channel recesses to precisely aline the tips, and enlarged circular nut members of larger diameter than the vertical width of the tweezers hold the tips on the handle portion and provide rest supports and finger discs.

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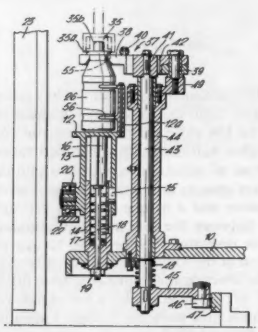
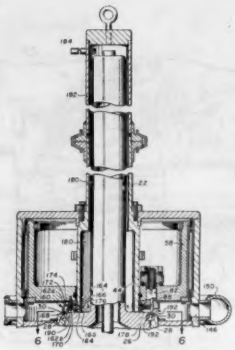
**3,818,785**
**BOTTLING SYSTEM**
**Shigeru Wakabayashi, Tokushima, Japan, assignor to Shikoku Kakooki Co., Ltd., Tokushima, Japan**
**Filed Mar. 27, 1972, Ser. No. 238,289**
**Claims priority, application Japan, Aug. 27, 1971, 46-18074**
**Int. Cl. B23b** *5/14*
**U.S. Cl. 82—101** **1 Claim**



A trimming turret for removing useless heads from moulded bottles. Bottles with useless heads are continuously conveyed in line by a conveyor into the turret and engaged at the entrance of the turret by starwheel transfer means which place the bottles into a turntable having a plurality of bottle receiving means disposed around the turntable. The bottles are then acted on by a bottle gripping member and bottle rotating means disposed over said bottle receiving means. The useless head is cut off by a cutting blade in the gripping means. The finished bottle is then removed from the bottle receiving means in the turntable by second star wheel transfer means to be then transported to the next work station.

**3,818,786**
**REMOTE CUTTING APPARATUS**
**Adam Leshem, Bloomfield, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.**
**Filed Dec. 21, 1972, Ser. No. 317,485**
**Int. Cl. B23b** *3/04, 3/22*
**U.S. Cl. 82—70.2** **6 Claims**



Apparatus is described for making an annular cut in a remote surface. The apparatus is particularly suited for use in cutting the weld of an omega seal between two elongated pressure members in a nuclear reactor. The apparatus is capable of substantially aligning itself in a cutting orientation and maintaining itself therein against dislodging forces. A cutting tool is adapted to be remotely driven into cutting engagement with the weld. Cleansing means are provided for preventing cutting chips from entering the void defined by the omega seal and for removing them from the cutting region.

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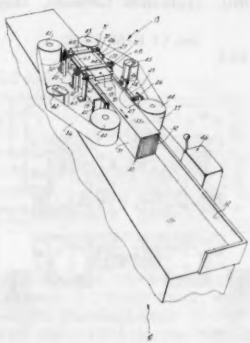
**3,818,787**
**PAD SLITTER**
**Howard Deutsch, 2444 Madison Rd., Cincinnati, Ohio 19452**
**Filed Jan. 4, 1973, Ser. No. 320,921**
**Int. Cl. B26d** *3/08*
**U.S. Cl. 83—7** **8 Claims**



A slitter for gang severing of the glued edge of a bulk size pad of paper, to divide it into several thinner pads. An unglued face surface of the pad is aligned against a fixed guide and is pressed toward the fixed guide while a cutter holder is moved

relative to the pad in a plane parallel to the glued edge. A blade lying parallel to the sheets of paper in the pad is oriented a predetermined distance from the guide, and projects through the glued edge so as to sever the latter without cutting the paper itself.

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**3,818,788**

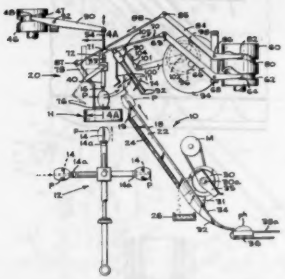
**PINEAPPLE SLITTING AND CONVEYING**

**Leslie Vadas, Los Gatos, Calif., assignor to Castle & Cooke, Inc., Honolulu, Hawaii**

**Division of Ser. No. 233,130, March 9, 1972, Pat. No. 3,760,665. This application Mar. 29, 1973, Ser. No. 345,929**

**Int. Cl. B26d** *3/08, 7/06*

**U.S. Cl. 83—9** **5 Claims**



Precored pineapples are contour peeled in a row of contour peeling heads. The precored and peeled pineapples from each peeling head are transferred to a downwardly inclined slide rod having a depending slitter knife and a slit guide flange for slitting and guiding the lower side of the fruit. The partially slit pineapples slide down the guide rod and pass beneath an upper slitter which completes the halving operation. The halved pineapples progress on the chutes that are progressively twisted from a vertical plane at the second slitter to a horizontal plane while the chutes gradually diverge. A juice trough is suspended from the lower edge of the slit guide flange and flexible flaps at the second slitter assist in retaining the pineapples on the twisted chutes.

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**3,818,789**

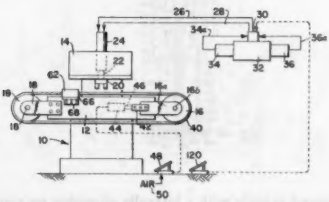
**METHOD FOR PUNCHING RUBBERIZED WIRE REINFORCED SHEET MATERIAL**

**William J. Vargo, 1631 Huguelet St., Akron, Ohio 44305**

**Filed Aug. 25, 1971, Ser. No. 174,725**

**Int. Cl. B23b** *3/28;* **B26f** *1/14*

**U.S. Cl. 83—18** **3 Claims**



The invention relates to a method for effectively and precisely cutting holes into wire reinforced rubber sheets or webs. Essentially, the technique is achieved by stretching the sheet so that the wires and rubber therein are under tension, providing means to effect a shearing cutting action progressively from substantially opposed points towards each other by punching a cutter through the sheet with a slow powerful stroke, while simultaneously supporting the sheet around the periphery of the hole punched. With the sheet and wires therein under tension during this punch shear cut, a highly precise hole is formed thereby overcoming the natural tendency of the rubber to buckle and sway and cause a jagged irregular cut.

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**3,818,790**

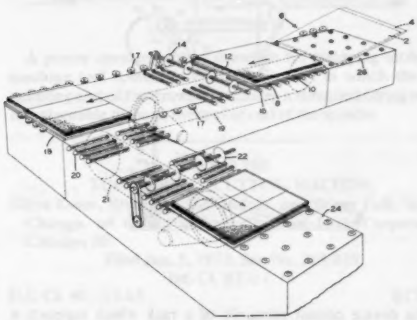
**CARPET TILE CUTTER**

**Charles R. Culp, and Jacob A. Otthofer, Jr., both of Lancaster, Pa., assignors to Armstrong Cork Company, Lancaster, Pa.**

**Filed Nov. 29, 1972, Ser. No. 310,386**

**Int. Cl. B26d** *7/06*

**U.S. Cl. 83—408** **2 Claims**



An apparatus is provided for making carpet tiles. Large pieces of carpeting material are fed through a series of carpet cutters to form one-square-foot carpet tiles. A large piece of carpeting or a carpet slug is automatically fed onto a conveyor structure and passed by several carpet cutters which cut the carpet slug into a plurality of one-square-foot carpet tiles. Carpet is conveyed on a needle bed support structure with the carpet face against the needles of the needle bed so that the carpet cutters will cut on the back surface of the carpet.

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**3,818,791**

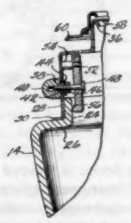
**INTERCHANGEABLE DRUM RESONATORS AND GENERATORS**

**William Zickos, 10212 W. 96th Ter., Overland Park, Kans. 66212**

**Filed July 2, 1973, Ser. No. 375,540**

**Int. Cl. G10d** *13/02*

**U.S. Cl. 84—411** **2 Claims**



A drum assembly is provided whereby drum resonators of various shapes and sizes, each having its own tonal qualities, is

provided with a collar to receive thereon one or another interchangeable generator provided with clamping means for quickly interchanging one or another generator with a selected shaped resonator.

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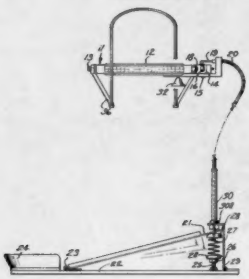
3,818,792
CHROMATIC HARMONICA RACK
William Gerbetz, Rt. 1, Box 325H, Red Oak, Tex. 75154
Filed Sept. 6, 1973, Ser. No. 394,853
Int. Cl. G10d 7/12
U.S. Cl. 84—379 6 Claims



This device consist primarily of a rack which supports a chromatic harmonica, a microphone, a pivotable lever and rhythm device. The device includes a spring loaded foot pedal which pivots the lever so that it may strike the valve head and the travel of the rhythm stroke of the lever is limited by spring return means of the harmonica valve head.

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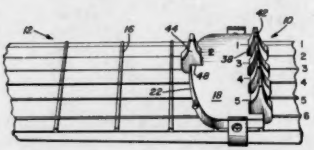
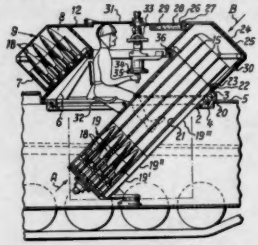
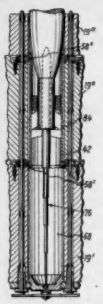
3,818,793
GUITAR TUNER
Lowell D. Round, 1741 P St., Eureka, Calif. 95501
Filed Oct. 2, 1972, Ser. No. 294,474
Int. Cl. G10g 7/02
U.S. Cl. 84—454 7 Claims

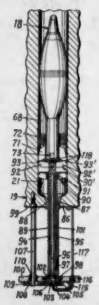


The body of a tuning device is secured by a strap to the fingerboard of a stringed instrument spaced by projecting feet from the strings. Lever elements pivotally mounted in slots at opposite edges of the body are selectively displaceable into engagement with the strings over two of the frets to accommodate tuning of each string in sequence while unfretted, to the tone of a preceding fretted string.

3,818,794
ARMORED VEHICLE WITH A LATERALLY ALIGNABLE MORTAR
Cornelius Mayer, Fallanden, and Rolf Burkhart, Bulach, both of Switzerland, assignors to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG, Zurich, Switzerland
Filed Mar. 12, 1973, Ser. No. 340,467
Claims priority, application Switzerland, Mar. 16, 1972, 3916/72
Int. Cl. F41h 7/06
U.S. Cl. 89—40 A 17 Claims







An armored vehicle with a laterally alignable mortar which can be operated by a gunner or firing personnel and encompassing launching barrels each possessing a propellant charge chamber for shells loaded at the muzzles. The launching barrels are rigidly mounted at a laterally alignable turret housing which houses the firing personnel or gunner of the armored

vehicle. The muzzles of the launching barrels are located at the wall of the turret. An annular compartment concentric to the axis of rotation of the turret and accommodating an infeed or delivery mechanism for the shells stored in magazines is arranged about the turret and protected by a hood. The magazines are movable relative to the turret by means of the infeed mechanism into a position in alignment with the launching barrels.

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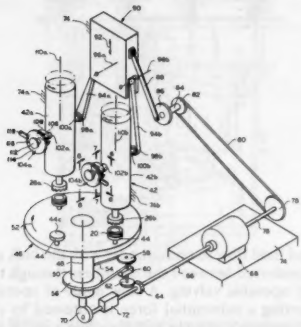
**3,818,795**
**GEAR TOOTH CHAMFERING**
**Robert Warren Upham, Jackson, Mich., assignor to Clark Equipment Company, Buchanan, Mich.**
**Filed Aug. 25, 1972, Ser. No. 283,842**
**Int. Cl. B23f** *19/10*
**U.S. Cl. 90—1.4** **12 Claims**



A machine for chamfering the ends of gear teeth, chamfering all of the teeth simultaneously in one direction. The machine includes two cutters, one for each direction of taper of the chamfer, i.e., a right hand and a left hand cutter. The chamfering is performed by moving the cutter toward the gear simultaneously axially and angularly, for producing the desired angle of chamfer, and adjustments can be made for varying that angle.

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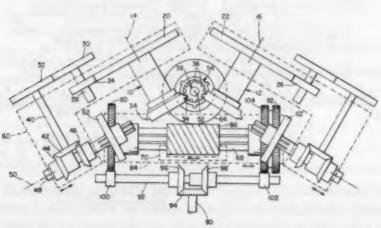
**3,818,796**
**CUTTING TEETH ON WORKPIECES**
**Ernest Wildhaber, Rochester, N.Y., assignor to Bird Island, Inc., Boston, Mass.**
**Filed Apr. 9, 1973, Ser. No. 348,888**
**Int. Cl. B23f** *1/06, 5/20, 9/08*
**U.S. Cl. 90—3** **12 Claims**



Apparatus for producing teeth in a rotary member featuring a rotatable workpiece, a pair of rotatable cutters arranged to respectively cut the opposite surfaces of each tooth, and a drive train for rotating the cutters and workpiece in timed relation to each other and effecting relative feed motion between the cutters and workpiece axially of the workpiece, each cutter being mounted for angular adjustment about an axis perpendicular to and intersecting both the workpiece axis and the respective cutter axis.

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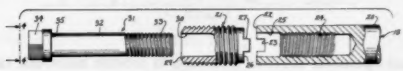
**3,818,797**
**DRAWBOLT FOR MACHINE TOOL SPINDLES**
**William D. Zettler, Fond du Lac, Wis., assignor to Giddings & Lewis, Inc., Fond du Lac, Wis.**
**Filed May 10, 1973, Ser. No. 359,202**
**Int. Cl. B23b** *31/10;* **B23q** *3/152*
**U.S. Cl. 90—11 D** **2 Claims**



A power operated rotary drawbolt for clamping tools in a machine tool spindle tool adapter socket in which the tool coupling end of the drawbolt includes a threaded fitting which is replaceable through the socket end of the spindle.

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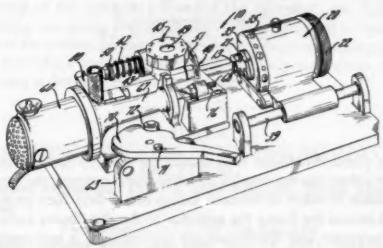
**3,818,798**
**TUBULAR KEY CUTTING MACHINE**
**Illijus Kotov, Riverside; Morris Falk, and Sidney Falk, both of Chicago, all of Ill., assignors to Fort Lock Corporation, Chicago, Ill.**
**Filed Jan. 3, 1972, Ser. No. 215,029**
**Int. Cl. B23c** *1/16*
**U.S. Cl. 90—13.05** **8 Claims**



A tubular key milling machine for machining grooves upon a tubular key blank of accurate axial length and accurate radial depth and at accurate angular locations.

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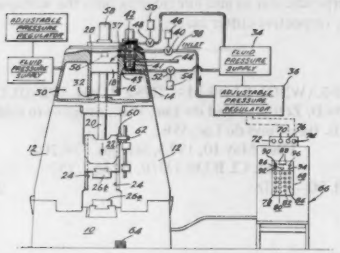
**3,818,799**
**CONTROL SYSTEM FOR AN IMPACT DEVICE**
**Wilmer W. Hague, Fayetteville, Pa., assignor to Chambersburg Engineering Company, Chambersburg, Pa.**
**Filed Oct. 30, 1972, Ser. No. 301,855**
**Int. Cl. F15b** *2/02;* **F01b** *1/00*
**U.S. Cl. 91—40** **14 Claims**

A pneumatic ram has its blow intensity varied by varying the time of opening of a valve connecting a constant pressure fluid supply to the cylinder in order to vary the fluid pressure applied to the piston driving the ram. Control means includes timing means to regulate opening of the valve and metering means. Programming is achieved by providing various stations

of selected blow intensities and using counting means to count preselected numbers of blows at each selected intensity. Automatic operation depends on means to provide automatic ram return to retracted position.



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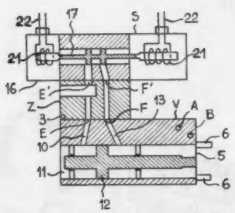
**3,818,800**

## ELECTROHYDRAULIC REMOTE-CONTROL DEVICES OF SLIDE DISTRIBUTORS

**Andre Bertaux, Rueil Malmaison, France, assignor to Hydraulique B.G., Rueil, Malmaison, France**

**Filed Nov. 1, 1972, Ser. No. 302,954**
**Claims priority, application France, Nov. 4, 1971, 71.39522**
**Int. Cl. F15b** *11/08, 11/16, 13/08*
**U.S. Cl. 91—411** **9 Claims**



In electrohydraulic remote-control devices for distributor slide valves having manual or mechanical control, the control actuator of each distributor comprises a first face provided with means for fixing the actuator to the distributor such that the actuator and distributor are separable by a movement of translation of axis perpendicular to the said face, a second face of functional connection with the said forward conduit and the said return conduit, and a third face provided with means for mounting an electrovalve on the actuator such that the electrovalve is separable from the actuator by a movement of translation perpendicular to this face.

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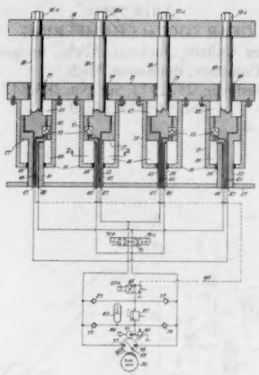
**3,818,801**

## FLUID ACTUATING MECHANISM HAVING ALTERNATIVELY SELECTABLE FAST AND SLOW MODES OF OPERATION

**James A. Kime, Columbus, Ohio, assignor to Hydron, Inc., Columbus, Ohio**

**Continuation of Ser. No. 194,752, Nov. 1, 1971, abandoned.**
**This application Jan. 29, 1973, Ser. No. 327,697**
**Int. Cl. F15b** *11/16*
**U.S. Cl. 91—411 B** **8 Claims**

A fluid actuating mechanism is provided having mechanically intercoupled first and second piston and cylinder units coupled with a fluid source and control circuit to selectively enable fast or slow modes of operation in either direction. The piston and cylinder units are of a double acting type with double-ended piston rod and having selectively operable valving to permit fluid flow between the two cylinder chambers. The piston rods of each unit are of relatively different diameters and are inversely oriented as between the two units, such that a fast mode of operation may be effected by directing a small pressurized fluid flow to one cylinder with the bulk of the fluid merely transferred between the chambers through the opened selectively operable valving. A slow mode of operation capable of exerting a substantial force is obtained by closing the selectively operable valving and directing a small pressurized fluid flow to one chamber of each cylinder. In one embodiment of this invention, the selectively operable valving is located in the pistons to reduce fluid transfer conduits required externally of the apparatus.



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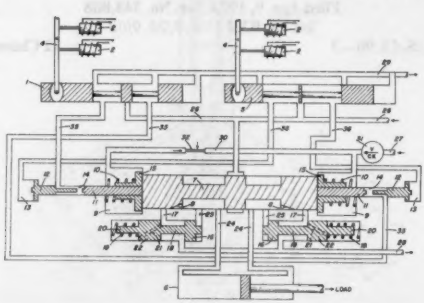
**3,818,802**

## SPEED CONTROL MECHANISM

**Richard C. Wilson, Champlin, Minn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Apr. 27, 1972, Ser. No. 248,149**
**Int. Cl. F15b** *11/08, 13/042*
**U.S. Cl. 91—443** **4 Claims**



A speeed control mechanism having a main spool valve and metering valves controls the output to and return flow from an hydraulic fluid actuator. The main spool valve controls the direction and acceleration of the actuator, and the metering

valves determine the maximum velocity of the actuator independent of the load. Adjustment features are provided to control the maximum displacement and the speed of the displacement of the main spool valve. Moreover, a novel adjustment feature is incorporated into the main spool valve to control the maximum volumetric flow rate through the metering valves.

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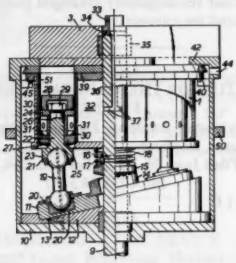
**3,818,803**
**PUMPS**

**George William Pearson Scott, Stroud, and Kenneth Henry Lloyd, Gloucester, both of England, assignors to Severn Pumps Limited, Gloucestershire, Great Britain**

**Filed Nov. 20, 1972, Ser. No. 307,942**
**Claims priority, application Great Britain, Nov. 24, 1971, 54303/71**
**Int. Cl. F01b** *13/04*
**U.S. Cl. 91—499** **15 Claims**



An axial piston pump is adapted to pump concrete or other slurries. On the suction side a wedge device is arranged to direct the concrete into or away from the cylinders according to whether the solid lumps are correctly placed for easy entry into the cylinders or likely to cause an obstruction at the downstream end of the suction side. A water barrier separates the concrete space from the oil filled drive mechanism and there is water lubrication of the working face of the cylinder block.

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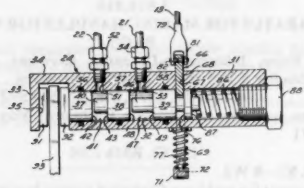
**3,818,804**
**DUAL BRAKE SYSTEM**

**Paul J. Miller, Richmond Hts., Ohio, assignor to The Weatherhead Company, Cleveland, Ohio**

**Filed Dec. 13, 1971, Ser. No. 207,096**
**Int. Cl. F15b** *15/26*; **F01b** *7/00*
**U.S. Cl. 92—23** **3 Claims**



A slave brake actuator and dual control circuit wherein the actuator is energized by either of a pair of redundant fluid circuits and by an auxiliary mechanical control in case of a total circuit failure or for normal parking situations. The actuator includes a pair of tandemly arranged pistons each responsive to fluid pressure in a separate circuit to produce a braking force on a common brake member, the force of the rearward piston being transmitted through the forward piston. In tandem with the pistons is a spring loaded plunger operable to apply a mechanical brake force through the pistons. The actuator arrangement causes the fluid circuitry to be automatically proof-tested when energized to disengage the mechanical spring force.

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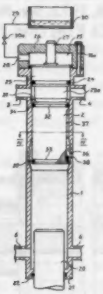
**3,818,805**
**PISTON AND CYLINDER APPARATUS WITH CLEANING ARRANGEMENT**

**Bjorn-Olow Johansson, Lomma, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden**

**Filed June 12, 1973, Ser. No. 369,255**
**Claims priority, application Sweden, June 19, 1972, 8042/72**
**Int. Cl. F01b** *31/14*; **F15b** *15/24*
**U.S. Cl. 92—13.1** **9 Claims**



At its opposite ends, the piston has annular seals which, in a cleaning position of the piston, are located in respective separated zones of the cylinder where its internal diameter is greater than the diameter of the seals, so that cleaning liquid from an inlet opening of the cylinder can be forced directly into one of these zones, thence to the other zone by way of a longitudinal recess in the piston, and then through an outlet opening of the cylinder, whereby the two seals are flushed. Limiting means are provided which, during normal reciprocation of the piston, prevent it from moving to this cleaning position but which are adjustable to permit such movement when cleaning is desired.

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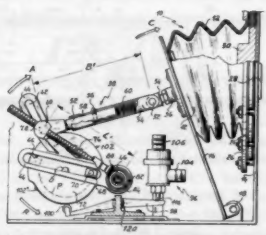
**3,818,806**
**PUMPING DEVICE FOR PROMOTING PATIENTS BREATHING**

**Giovanni Fumagalli, 11, Via delle Primule, 20146 Milano, Italy**

**Filed June 9, 1972, Ser. No. 261,160**
**Claims priority, application Italy, June 15, 1971, 25864/71**
**Int. Cl. F01b** *19/00*, *31/14*
**U.S. Cl. 92—13.2** **5 Claims**



A pumping device having a bellow-type pumping assembly having a stationary and an oscillating end portion, and a

mechanism for reciprocating said end portion between a given minimum volume and an adjustable maximum volume position, the said mechanism including a spring biased connecting rod, designed to transmit a force not greater than a given value, and a motor reciprocated arm along which one end of said rod is pivotally connected at operator adjustable positions for modifying the actual length of said arm and therefore the amplitude of the variation of said volume, while the pressure built-up in said chamber cannot be higher than that provided by the force which can be applied to said oscillating end portion by said spring biased rod.

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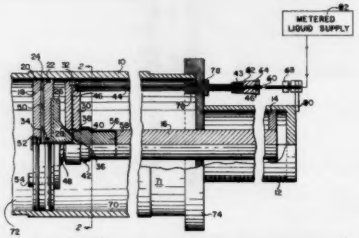
**3,818,807**
**SLURRY PUMP PISTON SEAL**

**Charles A. Semple, Midland, Tex., assignor to Engineered Concrete Placer, Inc., Midland, Tex.**

**Filed Dec. 6, 1972, Ser. No. 312,765**
**Int. Cl. F16j** *1/08, 15/40*
**U.S. Cl. 92—86.5** **10 Claims**




In a slurry pump pumping cylinder, a system for liquid-sealing of the pumping cylinder head with respect to the interior walls of the pumping cylinder. Particularly, a pair of spaced apart resilient rings peripherally encircling the pumping head, a annular sealing recess intermediate the rings and a source of liquid pumping sealant continuously supplied to the annular liquid recess by means of a conduit extending reciprocably within the pumping cylinder.

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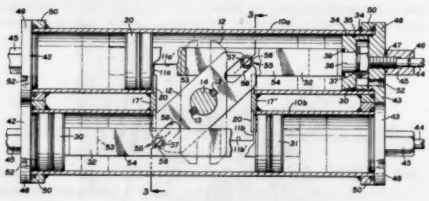
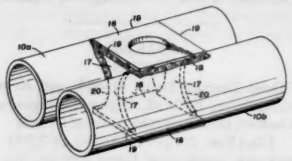
**3,818,808**
**DUAL CYLINDER OPERATOR FOR IMPARTING ROTARY MOTION**

**Homer J. Shafer, 2300 Park Ave. W., Mansfield, Ohio 44906**

**Continuation-in-part of Ser. No. 72,018, Sept. 14, 1970, Pat. No. 3,709,106. This application Oct. 19, 1972, Ser. No. 299,046**
**Int. Cl. F01b** *9/00, 1/12*
**U.S. Cl. 92—138** **8 Claims**



A dual cylinder operator having two parallel cylinders each enclosing two pistons maintained in axially spaced relation by a connector bar, and a torque arm extending crosswise into said cylinders through interfacing cutouts in their inner side walls and having Scotch yoke connections with said connector bars. The torque arm is mounted on a shaft extending transversely between said cylinders for rotating the shaft as fluid pressure is applied selectively to the outer faces of the pistons.



The cavity formed between the cylinders in which the torque arm operates contains one end of said shaft and is completely enclosed by four rectangularly arranged plates welded to the cylinders around the cutouts.

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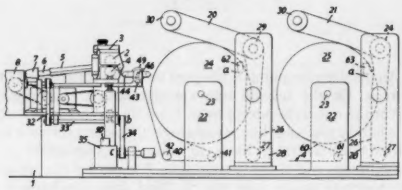
**3,818,809**
**APPARATUS FOR THE MANUFACTURE OF PAPER FILTERS**

**Herbert A. Sylvester, Basildon, England, assignor to Carreras Limited, Essex, England**

**Filed June 26, 1972, Ser. No. 266,139**
**Int. Cl. A24** *5/50*
**U.S. Cl. 93—1 C** **16 Claims**



Apparatus for delivering a web of material to a cigarette filter rod machine comprising means for supporting a reel of material from which the web is unrolled, frictional drive means which engage the periphery of the reel to cause it to rotate and a tension device which senses the tension in the web about to enter the filter rod machine, said device actuating means for varying the drive speed of the frictional drive means, to maintain a predetermined tension in the web.

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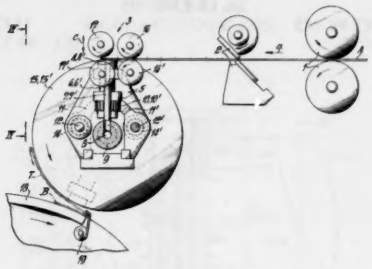
**3,818,810**
**APPARATUS FOR MAKING HANDLES FOR CARRIER BAGS**

**Frank Bosse, Ibbenburen-Dorenthe, Germany, assignor to Windmoller & Holscher, Lengerich, Germany**

**Filed May 15, 1973, Ser. No. 360,592**
**Claims priority, application Germany, May 26, 1972, 2225671**
**Int. Cl. B31b** *1/86*
**U.S. Cl. 93—8 WA** **6 Claims**

Apparatus for making a U-shaped carrier bag handle from a strip of plastics sheet material having end portions of the strip that are to form the limbs of the U-shaped handle folded over inwardly to overlie a central portion of the strip that is to form the web of the U-shaped handle, the said apparatus comprising a pair of rotary feeding and retaining rolls for a plastics web that has folded-over longitudinal margins, a pair of rotary severing rolls adapted to rotate faster than said feeding and retaining rolls and to engage the web intermittently so as to sever the strip from the leading end of the web, one of the

severing rolls being segmented to form a pair of cantilever-mounted stub rolls at an axial spacing from one another, a pair of movable suckers rotatable in opposite directions to engage the folded-over end portions of the severed strip and turn them at right-angles to the said central portion, a carrier for



said suckers adapted to move tangentially into and out of the space between the stub rolls, and drive means on said carrier effective to rotate said suckers through 90° in opposite directions in one sense as the carrier moves out of the said space and in the opposite sense as the carrier moves into the said space.

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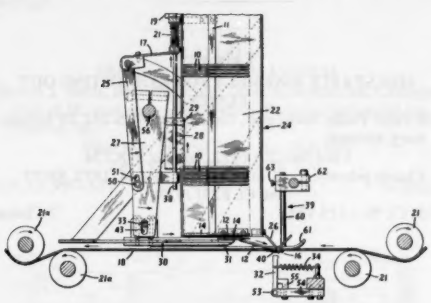
**3,818,811**

**HANDLE INSERTING DEVICE**

**Samuel Kleinhaut, Forest Hills, and Herbert Willy Thiel, Maspeth, both of N.Y., assignors to Bagprint Ltd., Long Island City, Utah**

**Filed Sept. 15, 1972, Ser. No. 289,358**
**Int. Cl. B31b** *1/86*
**U.S. Cl. 93—8 WA** **9 Claims**



Method and apparatus for automatically placing an insert into a sheet having a slit therein, wherein the slit is sufficiently opened to permit at least partial entry of the insert into the slit, and relative movement between the sheet and the insert is utilized to place the insert in the desired relationship within the slit.

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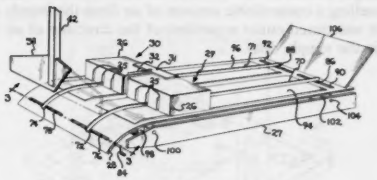
**3,818,812**

**TWO-CELL-TYPE CARTON FILLERS**

**Marion W. Buhs, Charlotte, Mich.; Reynold J. Cousino, and Frank J. DiFrank, both of Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio**

**Filed Mar. 23, 1972, Ser. No. 237,325**
**Int. Cl. B31b** *1/00*
**U.S. Cl. 93—37 R** **2 Claims**

Apparatus for the simultaneous assembly of two cell-type carton fillers. Machines which will insert transverse partition strips of corrugated paper material into notches formed in an advancing plurality of longitudinal partition strips of a similar corrugated material, thus assembling a cell-type filler for cartons, are well known in the art. This invention involves the use of a pair of parallel guide rails for feeding two independent



sets of transverse strips to the insertion mechanism of such a machine with the two strips being simultaneously placed in the notches of two independent sets of longitudinal strips. This allows the simultaneous assembly of two cell-type fillers on a machine which previously assembled but one such filler at a time.

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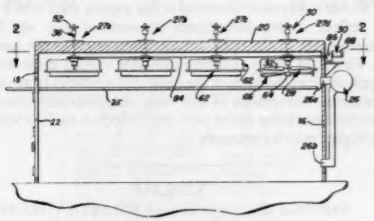
**3,818,813**

**ATMOSPHERE CIRCULATION SYSTEM**

**Carl R. Freeman, Hinsdale, Ill., assignor to Julian Engineering, Chicago, Ill.**

**Filed Jan. 5, 1973, Ser. No. 321,136**
**Int. Cl. F24f** *13/08*
**U.S. Cl. 98—33 A** **3 Claims**



An apparatus and method are disclosed for the circulation of an atmosphere within an enclosed chamber such as a smokehouse. The apparatus comprises a fan and a movable deflector located in the path of atmosphere stream from the fan. The deflector has adjustable louvres which may be locked in the desired position for angularly deflecting the atmosphere from the fan, and the deflector is connected to a power source such that the deflector may be continually moved to deflect and direct the atmosphere flow toward different areas of the chamber. In accordance with the method, the deflector is rotated in the stream of atmosphere from the fan with the speed of rotation being substantially slower for the deflector than for the fan blade.

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**3,818,814**

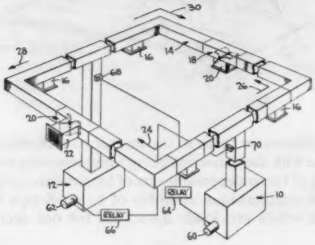
**AIR CONDITIONING SYSTEM AND COMPONENT THEREFOR DISTRIBUTING AIR FLOW FROM OPPOSITE DIRECTIONS**

**Henry D. Obler, Lanham, Md., and Hugh B. Bauer, Washington, D.C., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.**

**Filed Apr. 28, 1972, Ser. No. 248,471**
**Int. Cl. F24f** *13/08*
**U.S. Cl. 98—39** **12 Claims**

A novel air conditioning system and automatic air volume control apparatus therefor is disclosed for distribution of air

flow from two opposite directions. The air conditioning system, in the preferred inventive embodiment, comprises a plurality of separate air conditioning units coupled to a common supply duct such that air may be introduced into the supply duct in two opposite flow directions. A plurality of outlets such as registers or auxiliary or branch ducts communicate with the supply duct and valve means are disposed in the supply duct at at least some of the outlets for automatically channelling a controllable amount of air from the supply duct to the associated outlet regardless of the direction of air flow within the supply duct.




In a preferred inventive embodiment, the valve means comprises an automatic air volume control apparatus for distribution within the air supply duct into which air may be introduced from said two opposite directions. The apparatus incorporates a first air scoop disposed within the supply duct which deflects a pre-determined amount of any air flowing therethrough in one direction towards an outlet. A second air scoop is likewise disposed in the supply duct which serves to deflect a pre-determined amount of any air flowing therethrough in the opposite direction towards the same outlet. Finally, a freely swinging movable vane is disposed in the supply duct in the path of the deflected air flows from opposite directions, movement of the vane automatically channelling into the associated outlet only the deflected air flow which has the higher relative pressure.

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**3,818,815**

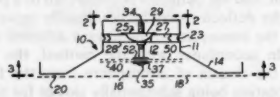
**SMUDGE ELIMINATING VARIABLE VOLUME SELECTIVE PATTERN CONTROL AIR DIFFUSER**

**Thomas L. Day, Brookfield, Conn., assignor to Connor Engineering Corporation, Danbury, Conn.**

**Filed July 27, 1972, Ser. No. 275,739**

**Int. Cl. F24f** *13/06*

**U.S. Cl. 98—40 D** **7 Claims**




An adjustable flow air diffuser for selectively controlling air flow from an air distribution system minimizing induction of dirty air into the discharged air stream to prevent smudging of the surfaces of the discharge outlet and permitting selection of desired air distribution patterns. By employing a selectively adjustable damper plate which is perforated, the damper serves to effect desired deflection of the primary air stream along paths transverse to the axis of flow through the diffuser, while some of the primary air passing axially through the damper acts to prevent dirt accumulations on the surrounding surfaces. Forming the damper plate with a slot at the point of securement to the support shaft serves to permit selective lateral shifting of the damper with respect to the supply duct axis to selectively vary air distribution patterns.

**3,818,816**

**TRAPDOOR FOR SMOKE EDUCTION**

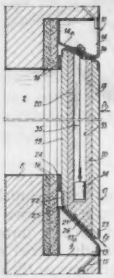
**Jean-Louis Petit, Sarcelles, France, assignor to Production Fusemes S.A., Pierrefitte, France**

**Filed Aug. 21, 1972, Ser. No. 282,034**

**Claims priority, application France, Aug. 31, 1971, 71.31539**

**Int. Cl. F24f** *7/06*

**U.S. Cl. 98—43** **11 Claims**



The trap-door comprises a wall provided with a communication opening edged by a rabbet in which is included a frame, at least lower side thereof being inclined downwards to delimit a sliding plane for a framing surrounding a panel maintained by at least one lock.

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**3,818,817**

**ADJUSTABLE ASSEMBLY FOR EXHAUSTING OUT FUMES**

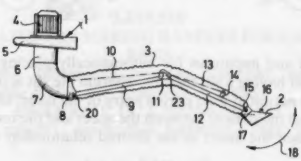
**Bill Peter Philip Nederman, Gransgatan 9, S-252 28 Helsingborg, Sweden**

**Filed Dec. 27, 1972, Ser. No. 318,734**

**Claims priority, application Sweden, Jan. 4, 1972, 89/72**

**Int. Cl. F23j** *11/08*

**U.S. Cl. 98--115 VM** **7 Claims**




Apparatus for removing noxious gases from a work area comprises a suction fan, a flexible tubing connected to the suction part of the fan, a suction casing mounted at the tube end and, provided within the tube, a lever system which consists of two lever arms of which one arm at one end is connected to the suction part of the fan and at the other end is connected to one end of the other arm, which is further connected to the suction casing.

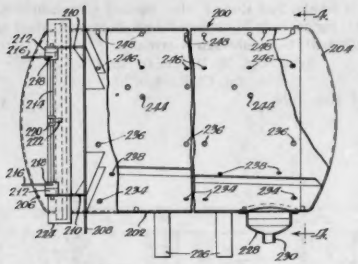
## 3,818,818
## APPARATUS FOR PROCESSING FOOD

Jack O. Hice, Sr., Broward, Fla., assignor to Vari-Phase, Inc., Deerfield Beach, Fla.

Division of Ser. No. 26,728, April 8, 1970, Pat. No. 3,672,908, which is a continuation-in-part of Ser. No. 585,230, Oct. 17, 1966, abandoned. This application Mar. 13, 1972, Ser. No. 234,275

Int. Cl. A47j *27/092, 27/62*

U.S. Cl. 99—330 7 Claims



A method of heat treating food including the steps of subjecting the food to be heat treated to superatmospheric pressure in a gaseous atmosphere prior to the application of heat to the food, applying heat to the food while maintaining the superatmospheric pressure on the food, rapidly cooling the food after the food has been heat treated to a desired extent, and removing the gaseous atmosphere under superatmospheric pressure from the food; and apparatus for practicing the method.

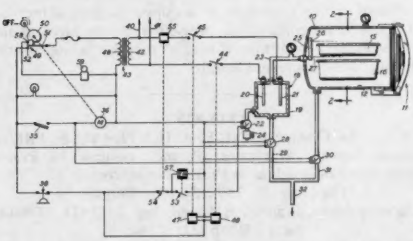
## 3,818,819
## PRESSURE COOKING SYSTEM

Robert J. Shulz, Brookfield, and Orest A. Kozinczuk, Chicago, both of Ill., assignors to Innovative Process Equipment Inc., Palatine, Ill.

Filed May 15, 1972, Ser. No. 253,409

Int. Cl. A47j *27/08;* A23l *3/16*

U.S. Cl. 99—330 7 Claims



A pressure cooking system employs an electrolytic steam generator which is energized only during a cooking cycle and drained and flushed at the end of each cooking cycle, a thermostatically controlled drain valve, and a water inlet control to the generator whereby low pressure steam is used to defrost frozen food placed in the cooking compartment and high pressure steam thereafter used to cook the food.

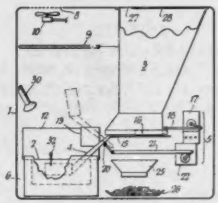
## 3,818,820
## FRIED PRODUCT DISPENSING APPARATUS

Derek James Harris, Maidenhead, and Jack Firth, Sunbury, both of England, assignors to CVS Chip Vending Services Limited

Filed Feb. 22, 1972, Ser. No. 227,900

Int. Cl. A47j *37/12*

U.S. Cl. 99—407 5 Claims



Food dispensing apparatus, particularly for dispensing fried potato products, includes a frying bath, a food hopper and a frying basket, the basket being movable to lift fried food from the bath and dispense it into a waiting container.

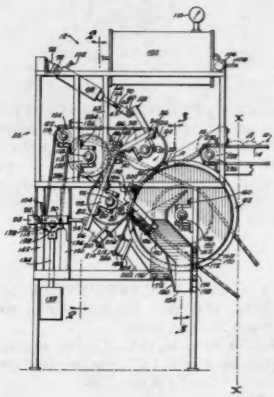
## 3,818,821
## APPARATUS FOR PEELING FRUIT AND VEGETABLES

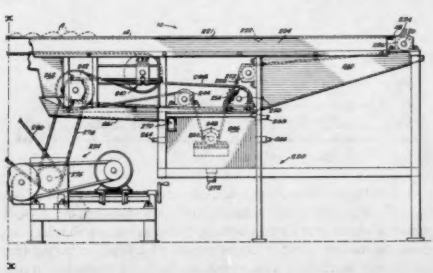
Harold E. Kendall, Jr., 1680 S. Bayshore Ln., Coconut Grove, Fla. 33133

Filed Jan. 2, 1973, Ser. No. 320,812

Int. Cl. A23n *7/00*

U.S. Cl. 99—540 11 Claims





An apparatus for removing the peels from the meats of segmented fruits and vegetables by directing the segments

between a moving belt and a rotating perforated drum, the moving belt being directed around two drums provided with individual pressurizing means for automatically controlling the amount of meat removed from the peel in direct proportion to the consistency of the meat as determined primarily by the ripeness of the fruit or vegetable. After the desired amount of meat is removed from the peels, said meat is discharged in pulp form into an appropriate receptacle and the peels are discharged from between the belt and the perforated drum.

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**3,818,822**

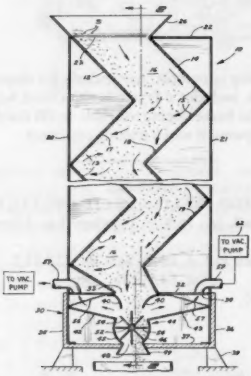
**SEED ABRADING DEVICE**

**Max C. Rehder, 510-7 Ave. S., Moorhead, Minn. 56560**

**Filed June 15, 1972, Ser. No. 263,234**

**Int. Cl. B02b** *3/00;* **A01c** *1/00*

**U.S. Cl. 99—600** **1 Claim**




A seed abrading apparatus formed as a chute comprising a pair of closely spaced vertically disposed angularly stepped walls, said walls having facing abrading surfaces, suction means in connection with said chute drawing a turbulented air stream downwardly therethrough impacting said seeds in a tumbling action against said abrading surfaces and a discharge means at the foot of said chute.

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**3,818,823**

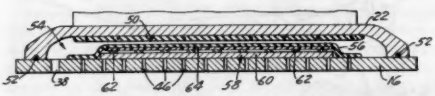
**HEATED, VACUUM-PRESSURE PRESS**

**Herbert M. Bond, Stillwater, Wash., assignor to Buckbee-Mears Company, St. Paul, Minn.**

**Division of Ser. No. 869,594, Oct. 27, 1969, abandoned. This application June 6, 1972, Ser. No. 260,338**

**Int. Cl. B30b** *15/34*

**U.S. Cl. 100—93 P** **1 Claim**



A combination heated, vacuum and pressure press is provided for facilitating the transfer of a substance from a workpiece to which it is weakly adhered to a substrate to which it is more permanently adhered by means of a heat-activated thermosetting adhesive. The press consists of a platen having vacuum passages therein with a flexible blanket overlying the platen so that it may be drawn tightly to the platen upon application of the vacuum and a cover in the form of a dome sealingly engaging the platen and forming a chamber thereover, the cover having an internal heating element and the press having means to pressurize the interior of the chamber formed between the platen and the cover so that positive pressure can be exerted on the flexible blanket while the interior of the dome is at the same time heated to assure perfect transfer of a substance from a workpiece to a substrate underneath the blanket.

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**3,818,824**

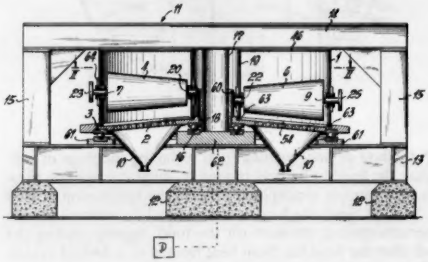
**APPARATUS FOR REMOVING LIQUID FROM AQUEOUS PULP**

**Herbert Kloda, and Rudolf Hies, both of Grevenbroich, Germany, assignors to Maschinenfabrik Buckau R. Wolf Aktiengesellschaft, Grevenbroich, Germany**

**Filed Sept. 20, 1972, Ser. No. 290,524**

**Int. Cl. B30b** *9/20*

**U.S. Cl. 100—116** **25 Claims**



A stationary housing has an open lower end across which extends a perforate wall mounted for rotation about a central vertical first axis of the housing. The wall is driven in a predetermined direction and has at least two pressure rollers associated with it, being located in the housing above the upper surface of the wall and mounted for rotation about a second axis extending transversely of the first axis. The roller which is downstream as seen with respect to the direction of rotation of the wall has its circumference closer to the upper surface of the wall than the other roller. An admitting arrangement admits aqueous pulp into the housing so that the pulp is distributed in form of a layer on the upper surface of the wall and liquid is progressively expressed from the layer as the same is passed beneath the rollers. A receptacle beneath the wall collects the expressed liquid.

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**3,818,825**

**DOUBLE-ACTING, CASING FRAME HYDRAULIC PRESS**

**Edmund Nowak, Warszawa, Poland, assignor to Przedsiebiorstwo Doswiadczalne Pras Automatycznych**

**Filed Aug. 15, 1972, Ser. No. 280,866**

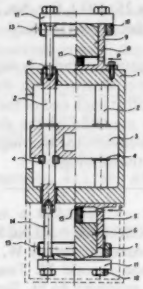
**Claims priority, application Poland, Aug. 16, 1971, 150044**

**Int. Cl. B30b** *1/34, 15/06*

**U.S. Cl. 100—209** **6 Claims**

The subject of the present invention is a double-acting hydraulic press built with a monolithic frame of a casing type. Fixed slidably within the frame are four columns on which the press platen is rigidly mounted. In this manner there are obtained two working zones of the press: a top and bottom zone, thus eliminating the idle stroke of the press. Both ends of the columns outside of the frame of a casing type are linked together with two plates which are operating jointly with power plungers. The power plungers are working inside the

cylinders mounted on the bottom and the top plate of the frame. Such a design ensures a reciprocal reduction of reac-



tions from the cylinder and from the tool, these reactions affecting the frame which in this instance does not show any practical deformation.

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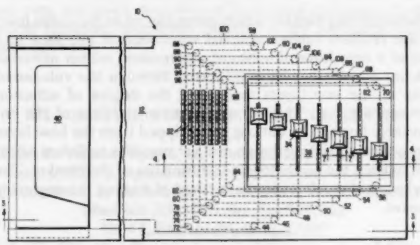
**3,818,826**

## RECESSED KEYBOARD IMPRINTER

**Franklin O. Geiger, Manassas, Va., assignor to Farrington Business Machines Corporation, Springfield, Va.**

**Filed July 28, 1972, Ser. No. 275,953**
**Int. Cl. B41j *3/44***
**U.S. Cl. 101—45** **17 Claims**



Apparatus for imprinting variable data onto a document disposed over print elements, the apparatus comprising a print bed having at least one opening therein, at least one settable print member having a plurality of the print elements disposed thereon, the print member being so disposed with respect to the print bed that at least one of the print elements projects through the opening for positioning in the print bed, setting means for setting the print member so that the one print element is positioned in the print bed, the setting means including (a) selector means for selecting which of the plurality of print elements is to be positioned in the print bed, the selector means being movable to a plurality of predetermined positions respectively corresponding to the plurality of print elements and being located in approximate alignment with the print member along the print bed; (b) flexible connector means fixedly connected to the print member and the selector means; and (c) pulley means for supporting the flexible connector means and changing the direction thereof so that the selector means may be located in any predetermined relationship with respect to the settable print member, and means for moving a roller platen along the print bed to effect imprinting from the print elements onto the document, detenting means for accurately positioning the selected print element in the print bed, and the setting means including positive positioning means for insuring that the detenting means does accurately position the selected print element whereby movement of the selector means to one of the predetermined positions will be transmitted through the flexible connector means to effect movement of the print member so that the print element corresponding to the one predetermined position will be positioned in the print bed.

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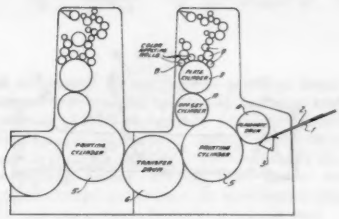
**3,818,827**

## CONTROL ARRANGEMENT FOR MULTIPLE COLOR PRINTING MACHINES

**Albrecht Johne; Karl Heinz Forster, both of Dresden, and Klaus Schanze, Radebeul, all of Germany, assignors to Veb Polygraph Leipzig Kombinat Fur Polygraphische Maschinen und Ausrustungen, Leizig, Germany**

**Filed Nov. 9, 1971, Ser. No. 196,955**
**Int. Cl. B41f *13/24***
**U.S. Cl. 101—184** **30 Claims**



An arrangement for controlling the operation of multiple color printing machines adapted for printing on material in sheet form. A shift register has its output stages connected to sampling circuits which control the on and off operation of the machine in dependence on the information contents of the shift register stages. A sheet sensing station detects the position of a sheet of material and transmits the corresponding information into the shift register which is shifted by clocked signals at predetermined instants in the machine operation.

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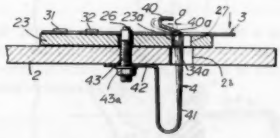
**3,818,828**

## CREDIT CARD PRINTING MACHINE

**Tetsuo Nakada, Sagamihara; Yoshiaki Ozaki, and Fumiyuki Mishima, both of Tokyo, all of Japan, assignors to Janome Sewing Machine Co., Ltd., Tokyo, Japan**

**Filed Dec. 28, 1971, Ser. No. 212,905**
**Claims priority, application Japan, Dec. 29, 1970, 45-133084; Feb. 24, 1971, 46-11211**
**Int. Cl. B41f *3/18***
**U.S. Cl. 101—269** **12 Claims**




A credit card printing machine has a carriage with a platen movable over a printing bed on which a credit card and a copy sheet or pad of copy sheets, are placed. A printing plate associated with the credit organization which issued the respective credit card, is detachably attached to a seat plate, and can be exchanged so that the used printing plate and credit card are always associated with the same credit organization. The

printing plate prints information regarding the name and code number of the store or dealer making the credit sale in the respective credit organization. This information, together with customer information from the credit card, are both imprinted on the used copy sheet. The attachment of the printing plate is effected by pins and a clamping spring so that no tool is required for exchanging printing plates to conform to the credit organization of a respective used credit card. Other printing plates, associated with other credit organizations, are stored in a compartment of the housing of the printing machine.

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**3,818,829**

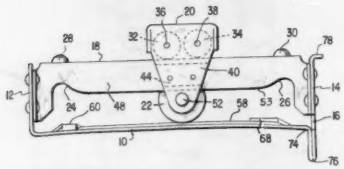
**PORTABLE IMPRINTER INCLUDING MEANS FOR PROVIDING IMPRINTING PRESSURE COMPENSATION**

**James M. Patterson, Jr., Springfield, Va., assignor to Farrington Business Machines Corporation, Springfield, Va.**

**Filed May 12, 1972, Ser. No. 252,753**

**Int. Cl. B41f** *3/04*

**U.S. Cl. 101—269** **5 Claims**




Apparatus for imprinting data from a printing plate onto a document, the apparatus comprising a print bed for supporting the printing plate, means for receiving the document for disposing it over the printing plate, a roller platen, means for moving the roller platen along the print bed to effect the imprinting, and means for imparting a bow in the print bed toward the roller platen so that the print bed is depressed during the imprinting to provide imprinting pressure compensation for various combined thicknesses of the printing plate and the document.

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**3,818,830**

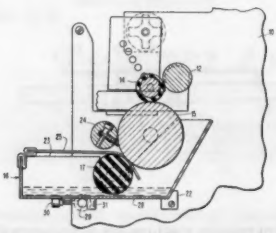
**ARRANGEMENT FOR SUPPLYING INK FOR A PRINTING MACHINE**

**John E. Schultz, Cincinnati, Ohio, assignor to International Machine Products, Inc., Cincinnati, Ohio**

**Filed May 15, 1972, Ser. No. 253,345**

**Int. Cl. B41f** *31/06, 31/14*

**U.S. Cl. 101—350** **1 Claim**



A rubber roll picks up ink from an ink reservoir and supplies it to the cells of an anilox roller to completely fill the cells through the rubber roll exerting a selected adjustable pressure on the anilox roller.

**3,818,831**

**HEAVY DUTY PLATE ROLL**

**John E. Schultz, Cincinnati, Ohio, assignor to International Machine Products, Inc., Cincinnati, Ohio**

**Filed May 25, 1972, Ser. No. 256,835**

**Int. Cl. B41f** *13/20*

**U.S. Cl. 101—375** **4 Claims**

A plate roll of a printing cylinder is supported along its entire length by a sleeve. Bearings are disposed between the sleeve and the plate roll at each end of the plate roll so that the plate roll is rotatably mounted on the sleeve. An annular oil reservoir is disposed between the bearings, the sleeve, and the plate roll to lubricate the bearings.

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**3,818,832**

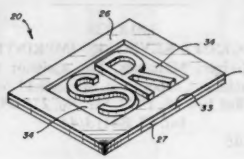
**METHOD OF FORMING AN ENGRAVED PLATE**

**Thomas E. Coale, Pensacola; Sidney W. Gunn, Cantonment; Frank Merrigan, and Donald M. Tompkins, both of Pensacola, all of Fla., assignors to St. Regis Paper Company, New York, N.Y.**

**Filed Aug. 2, 1972, Ser. No. 277,281**

**Int. Cl. B41c** *1/02;* **B32b** *31/12, 31/18*

**U.S. Cl. 101—401.1** **3 Claims**




An engraving blanket which comprises an engraveable layer of live resilient rubber material vulcanized at one face to a face of a base layer of nonhard, nonresilient rubber material. Talcum powder is evenly dispersed between the vulcanized faces of the two layers to control the degree of adhesion between the two. This permits selected portions of the engraveable layer to be cut out and stripped from the base layer to produce a printing design and yet provides sufficient adhesion to keep the layers together during use of the blanket. The disclosure also relates to the method of making the engraving blanket.

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**3,818,833**

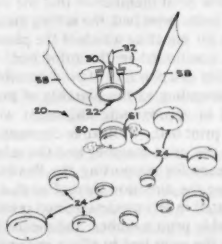
**INDEPENDENT MULTIPLE HEAD FORWARD FIRING SYSTEM**

**Guy C. Throner, Jr., Saratoga, Calif., assignor to FMC Corporation, San Jose, Calif.**

**Filed Aug. 18, 1972, Ser. No. 281,904**

**Int. Cl. F42b** *25/16*

**U.S. Cl. 102—7.2** **8 Claims**




A missile carries a plurality of independent explosive heads which when fired direct fragments only in a forward direction.

The missile releases all heads either in response to a timed delay from drop or launch or in response to movement of the missile to a predetermined position relative to the target. Upon release the explosive heads are rotated to swing each head away from the other heads while retaining orientation of each head so that firing of the dispersed heads will cause fragments to discharge forwardly toward the target without undue interference with the fragments from other heads.

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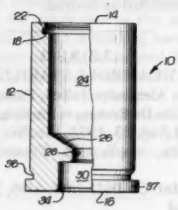
**3,818,834**

## REUSABLE BLANK CARTRIDGE AND RELOADING ASSEMBLIES

**Kenneth A. Baumgartener, 412 W. Almora St., Monterey Park, Calif. 91754**

**Filed Feb. 4, 1972, Ser. No. 223,653**
**Int. Cl. F42b** *5/22*
**U.S. Cl. 102—41** **2 Claims**



A reusable blank cartridge designed to provide safe firing of blanks by the use of loose powder and a hand insertable disc, and easy and quick reloading of fired blank cartridges by the use of reloading assemblies adapted to the particular blank cartridge used.

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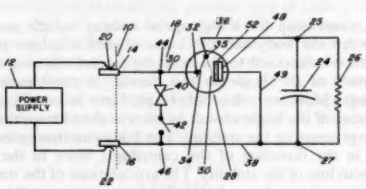
**3,818,835**

## SELF-DESTRUCT FUZE WITH ELECTROSTATIC SWITCH

**Daniel E. Valatka, Sparta, and Bernard Fairbanks, Stanhope, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed Jan. 23, 1973, Ser. No. 325,962**
**Int. Cl. F42c** *11/06, 9/00, 11/00*
**U.S. Cl. 102—70.2 R** **2 Claims**



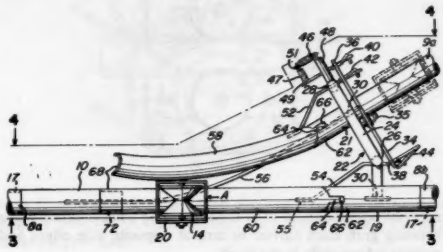

A self-destruct time device has a resistance shunted capacitor charged by a power supply, prior to launch of a munition, through a normally open latching spin switch and an intermittently normally closed single pole electrostatic switch. The power supply is automatically disconnected from the projectile as soon as the munition is launched. A detonator, connected into a timing circuit by the spin forces of a launched projectile, is subsequently fired after projectile impact when the electrostatic switch is reswitched, as a function of the RC time constant, from its open position to its normally closed position because of reduced electrostatic force on its pole piece.

**3,818,836**

## SWITCH MECHANISM FOR OVERHEAD TROLLEY

**Wilson H. Swilley, Richmond, Calif., assignor to The Cincinnati Butchers Supply Company, Cincinnati, Ohio**

**Filed June 19, 1973, Ser. No. 371,347**
**Int. Cl. E01b** *25/26*
**U.S. Cl. 104—100** **18 Claims**



A switch mechanism for use with an overhead track network is adapted to be inserted between spaced apart end sections of a plurality of track elements for selectively directing a trolley riding thereon from one to another of the elements wherein each of the track and switch elements are of like circular cross-section, having internal fixed and/or hinged couplings therebetween to minimize the interference encountered by the trolley as it passes from element to element.

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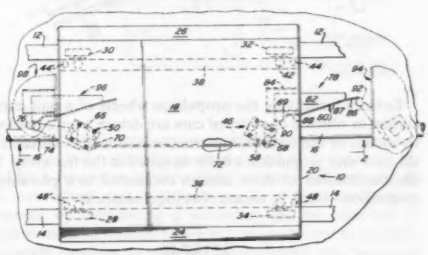
**3,818,837**

## VEHICLE AND TRACK SYSTEM

**Charles E. Jacoby, Bethlehem, and Per Eric Lindqvist, Easton, both of Pa., assignors to SI Handling Systems, Inc., Easton, Pa.**

**Filed Oct. 6, 1972, Ser. No. 295,766**
**Int. Cl. B61b** *13/00*
**U.S. Cl. 104—166** **13 Claims**



A vehicle for use on a track system has a speed control means on its front end for cooperation with a cam on the rear end of the next vehicle on the track system to effect dense accumulation of vehicles along the system.

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**3,818,838**

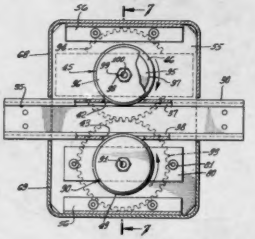
## MECHANICAL DRIVE MODULE

**William D. Morton, Jr., San Diego, Calif., assignor to Delta Design Inc., San Diego, Calif.**

**Continuation-in-part of Ser. No. 44,401, June 8, 1970, Pat. No. 3,677,401. This application Mar. 7, 1972, Ser. No. 232,389**
**Int. Cl. B61d** *13/10*
**U.S. Cl. 104—168** **14 Claims**

A modular track assembly for transporting carriers for integrated circuit units has a plurality of track sections of vari-

ous shapes releasably interconnected to form a continuous track and transport carriers from a loading station to a discharge station. Boosters are built into some of the track



sections which consist of counter rotating wheels which while rotating grab each carrier in turn at opposite side edges and project it forwardly in the track.

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**3,818,839**

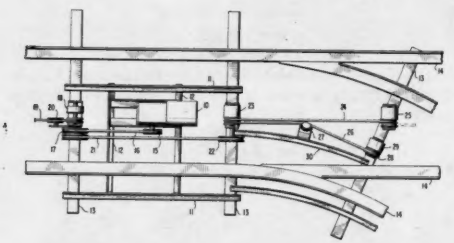
**PARALLEL WHEEL DRIVE**

**Larry C. Armstrong, Ellwood City, Pa., assignor to Rexnord Inc., Milwaukee, Wis.**

**Filed Nov. 24, 1972, Ser. No. 309,027**

**Int. Cl. B61b** *13/00*

**U.S. Cl. 104—168** **2 Claims**



Devices for driving the propulsion wheels of a unit carrier system in which a plurality of cars are driven over a trackway by means of the frictional interaction of reaction surfaces on the cars with propulsion wheels mounted in the trackway. The devices consists of drive motors connected to a plurality of propulsion wheels by means of belts, chains, etc.

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**3,818,840**

**POWER AND FREE CONVEYOR SYSTEM**

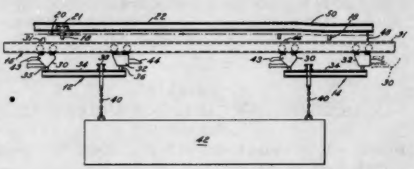
**Clarence A. Dehne, Farmington, Mich., assignor to Jervis B. Webb Company, Detroit, Mich.**

**Filed Nov. 15, 1972, Ser. No. 306,547**

**Int. Cl. B65g** *17/42*

**U.S. Cl. 104—172 S** **10 Claims**

A power and free conveyor system having a plurality of carriers which circulate on a carrier supporting track from a loading station to an unloading station and return, each carrier having a driving dog releasably engageable by one of a plurality of pushers of a propelling member supported on an adjacent track. Along the forwarding portion of the system extending from the loading station to the unloading station, the carriers are employed in pairs, each pair comprising a forward carrier and a rearward carrier to which the load is attached and which operator as a unit in the conveyance of the load. Engagement between a pusher and the driving dog of the rearward carrier of a pair is prevented along this forwarding portion of the system, alternate arrangements being disclosed for this purpose. An operative relationship between the pushers and the



driving dog of each rearward carrier of a pair is provided for along the return portion of the system from the unloading to the loading station so that the carriers can be individually propelled and controlled as desired.

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**3,818,841**

**RAILWAY CAR ROLL STABILIZING BOGIE**

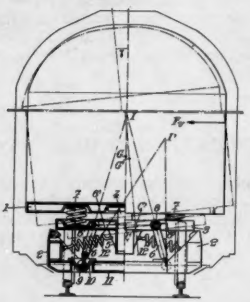
**Maurice Francois Alexandre Julien, Paris, France, assignor to Luxembourgeoise De Brevets et Participations**

**Filed Aug. 13, 1971, Ser. No. 171,608**

**Claims priority, application France, Aug. 28, 1970, 70.31604**

**Int. Cl. B61f** *3/08, 5/06, 5/24*

**U.S. Cl. 105—164** **18 Claims**



A suspension for a high-speed railway vehicle comprises between the body and the bogie chassis a bolster platform which is connected to the body by a pivot allowing the free rotation of the bogie in the curves, in combination with springs. Moreover, the bolster platform is connected to a transom of the bogie chassis by an articulated trapezium, with springs ensuring the stability. The body can thus orientate itself in the direction of the centrifugal force in the curves without loss of the stability. The articulations of the trapezium are situated very low, which reduces to a minimum the dynamic transfers to the axles.

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**3,818,842**

**RAPID DISCHARGING HOPPER CAR DOOR ACTUATING MECHANISM**

**James C. Heap, Munster, Ind., assignor to Thrall Car Manufacturing Company, Chicago, Ill.**

**Continuation-in-part of Ser. No. 297,788, Oct. 16, 1972. This application Apr. 19, 1973, Ser. No. 352,693**

**Int. Cl. B61d** *7/04, 7/18, 7/26*

**U.S. Cl. 105—240** **24 Claims**

A mechanism for opening and closing a pair of horizontally hinged doors, such as on a railroad hopper car, having a tie-

rod actuating means adapted to be rotatably mounted to a car, a pair of tie-rods with each tie-rod pivotally and slidably joined at a first end to the tie-rod actuating means and joinable at the second end of one of the doors on the car, the first ends of the tie-rods being slidable in an arcuate sector guide path in the tie-rod actuating means, a stop at one end of the guide path being capable of limiting downward displacement of the tie-rods when the door is open and said same means at the guide path end upon rotation of the tie-rod actuating means in one direction lifts the tie-rods to maximum upward position thereby rotating a door

to which it may be attached into closing and locking position, and means at the other end of the guide path which, upon rotation of the tie-rod actuating means in the opposite direction through an angle defined by the length of the arcuate sector guide path and with the tie-rods stationary, forces and frees the first end of the tie-rods from maximum lifted and locked position to fall unrestrainedly downwardly through the arcuate guide path thereby permitting the door to which it is attached to rotate open rapidly by gravity.

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**3,818,843**

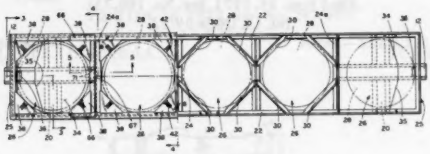
**CONTAINER CAR**

**Sang H. Lee, Homewood, Ill., assignor to Pullman Incorporated, Chicago, Ill.**

**Filed Nov. 3, 1972, Ser. No. 303,431**

**Int. Cl. B65j *1/22***

**U.S. Cl. 105—366 R** **3 Claims**



A center sill-less skeletonized gondola type of railway vehicle having framed reinforced receptacles for positioning and transporting cylindrical containers which are carried with their axis extending vertically of the vehicle. A low deck design is used to provide a low center of gravity and vehicle stability. Pivoted spring biased latching devices engage the top rim of each container to stabilize the containers in the storage well during movement of the vehicle.

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**3,818,844**

**TRESTLE TYPE TABLE WITH FOLDING LEGS**

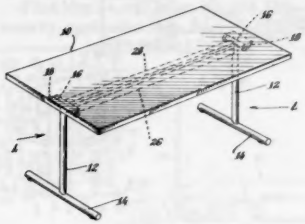
**Alan Carleton Burr, East Norwalk, Conn., assignor to Howe Furniture Corporation, New York, N.Y.**

**Filed Mar. 12, 1973, Ser. No. 340,464**

**Int. Cl. A47b *3/08***

**U.S. Cl. 108—132** **3 Claims**

A pair of I legs are attached to a table top spaced apart longitudinally of the top and mounted for folding and unfolding movement longitudinally of the top. A stretcher bar is rotatably supported by, and comprises part of, a bracket assembly, which is mounted on the top between the leg mountings for folding and unfolding movement transversely of the table top. Projecting from the ends of the stretcher bar are pin means with heads adapted, in one angular position of the bar to enter slots in the legs respectively when the bracket assembly is in unfolded position and the unfolded legs are moved toward the ends of the bar, and to extend across the



slots from within the legs when the bar is rotated to another angular position. A combination bar handle and bar locking means is provided.

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**3,818,845**

**LOW TEMPERATURE PLASMA INCINERATOR AND METHOD OF STABILIZING IMPEDANCE THEREIN**

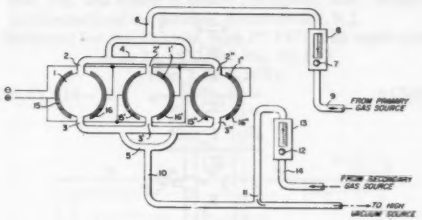
**Hisashi Nakane, Kawasaki, and Akira Uehara, Yokohama, both of Japan, assignors to Tokyo Ohka Kogyo Co. Ltd., Kanagawa-ken, Japan**

**Filed Dec. 20, 1971, Ser. No. 209,879**

**Claims priority, application Japan, Dec. 21, 1970, 45-130677**

**Int. Cl. F23g *3/04***

**U.S. Cl. 110—8 E** **6 Claims**




Rapid incineration of organic materials in a low temperature plasma incinerator for generation into a plasma by an applied high frequency electric field supplied with oxygen gas and maintained at a high vacuum by a vacuum pump is promoted by introducing a secondary gas between the incinerator and the vacuum pump at a rate sufficient to maintain a generally constant vacuum in the incinerator and thus avoid deviations in the electric impedance balance of the system.

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**3,818,846**

**METHOD AND APPARATUS FOR LIQUID DISPOSAL IN A FLUID BED REACTOR**

**Richard G. Reese, Woodside, Calif., assignor to Combustion Power Co. Inc., Menlo Park, Calif.**

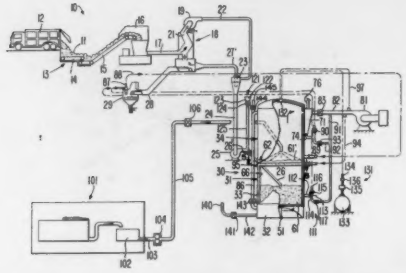
**Filed Apr. 26, 1972, Ser. No. 247,829**

**Int. Cl. F23g *5/02***

**U.S. Cl. 110—8 R** **68 Claims**

Method and apparatus are disclosed for liquid waste disposal using combustible waste material as a fuel in a fluid bed reactor. One combustion ingredient can be solid waste and one liquid waste ingredient can be sewage sludge. Control of the liquid feed is disclosed to control fluid bed temperature and control of combustible material feed is disclosed to con-

trol oxygen-to-combustibles ratio in the combustion chamber. A secondary bed/elutriation arrester may be provided above



the principal fluid bed. Particle separators for the combustion gases are provided and air pollution suppressants are added to the bed as required.

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**3,818,847**

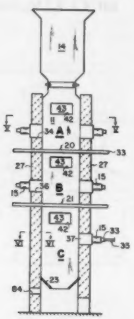
**MATERIAL TREATING FURNACE**

**Kurt Konrad, Pittsburgh, Pa., assignor to John A. Leam, Pittsburgh, Pa.**

**Filed Aug. 10, 1972, Ser. No. 279,438**

**Int. Cl. F23g** *5/00*

**U.S. Cl. 110—8 R** **11 Claims**



A furnace for treating materials, and in particular those having a high moisture content, comprising a vertical drying chamber having at least one and, preferably, two rotatable plate means spaced apart from each other and defining at least two chamber zones, the plate means preferably include air injection means on its material resident surface. The furnace includes heating means in at least the upper chamber and feed means for controllably feeding the material into the top of the chamber. A down draft plenum is provided between the plenum and furnace stack and is in selectable communication with the three chamber zones and stack.

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**3,818,848**

**BURNER FOR LIGHT COMBUSTIBLE MATERIALS**

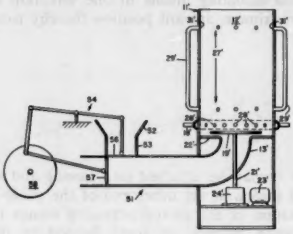
**Orian R. Gardner, 419 Marin Ave., Mill Valley, Calif. 94941**

**Division of Ser. No. 163,869, July 19, 1971, Pat. No. 3,744,440. This application May 16, 1973, Ser. No. 360,927**

**Int. Cl. F23g** *7/00*

**U.S. Cl. 110—18 R** **4 Claims**

A method and two embodiments of apparatus for providing efficient combustion wherein air and combustible materials are introduced into a bottom portion of a vertical chamber which is substantially open at its top, the combustible material being dispersed upwardly through a combustion zone with combustion products exiting through the open top of the chamber, gases which tend to be trapped beneath the combustion zone being vented from the chamber through suitable conduits and returned to an upper portion of the chamber if



desired for more complete combustion. One embodiment of the apparatus includes a feed duct extending downwardly through the chamber for introducing combustible material thereinto. Another embodiment of the apparatus includes a feed assembly with a hopper and feed mechanism for respectively receiving combustible material and urging it upwardly through a feed duct into the chamber.

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**3,818,849**

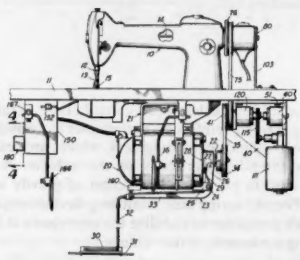
**INDEXING ATTACHMENT**

**John W. Maddox, Jr., Augusta, Ga., assignor to American Needle Positioners Inc., Augusta, Ga.**

**Filed Sept. 15, 1971, Ser. No. 180,731**

**Int. Cl. D05b** *69/22*

**U.S. Cl. 112—219 A** **2 Claims**



An attachment assembly operable on a sewing machine for automatically controlling cyclic movement of the machine sewing needle in a stitching operation. The attachment assembly includes transmission means having an input drive means and an output drive means. The sewing machine main motor drive means is operatively connected to the transmission input drive means and the transmission output drive means is connected to the machine sewing needle drive means. The power transmission drive means includes electromagnetic clutch means for operatively connecting the input drive means to the output drive means whereby the main motor drive means can transfer power to the sewing needle drive means for effecting continuous cycles of operation of the

sewing needle in a stitching operation. The power transmission means includes a second or alternate motor drive means having a drive member operatively associated with the power transmission output drive means, and wherein electromagnetic clutch means is operatively associated with said alternate motor drive means and the transmission output drive means. Control means is operatively associated with the main drive motor, the needle drive means and the alternate motor drive means for automatically controlling predetermined cyclic movement of the sewing needle. The control means includes interchangeable modular program means whereby the cyclic movement of the sewing needle can be altered by interchanging selected ones of a combination of modular program elements. Certain ones of the interchangeable modular program elements include means for effecting a control drive movement from the alternate drive motor to the needle drive means for driving the needle to either an up or down position in response to deactivation of the main drive motor. An additional interchangeable modular program element includes means for effecting driving movement from the alternate drive motor to the needle drive means for driving the needle drive means through a predetermined number of cycles of operation in response to deactivation of the main drive motor.

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**ERRATUM**

For Class 112—130 see:
Patent No. 3,818,851

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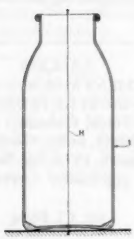
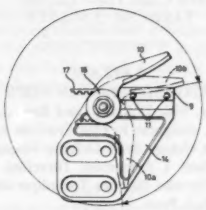
**3,818,850**
**METAL CONTAINER WITH ROLLED RIM**
**Andre Berthet, Bellegarde, France, assignor to Cebal, Paris, France**
**Filed Oct. 16, 1972, Ser. No. 297,997**
**Int. Cl. B21d** *41/04*
**U.S. Cl. 113—120 AA** **1 Claim**



This invention relates to the production of an elongated rolled rim on a metal container in which, in a first operation, the rim of the container blank, which has previously been leveled off, is rolled over by a tool which is displaced parallel to the axis of the container and the end of the operating travel of which is determined by its distance from the plane of the outside face of the bottom of the container, and in a second operation, the rolled-over portion is pushed downwardly by a second tool whose operational engagement surface is different from the first tool and whose operating travel is also limited by its distance from the plane of the outside face of the bottom of the container, the difference between the two distances determining the height of the rolled rim of the container.

**3,818,851**
**ONE-DIRECTION ROTATING BLADE FOR SEWING MACHINES CUTTERS**
**Nerino Marforio, Milan, Italy, assignor to Virginio Rimoldi & C.S.P.A., Milan, Italy**
**Filed May 24, 1972, Ser. No. 256,325**
**Claims priority, application Italy, June 17, 1971, 25944/71**
**Int. Cl. D05b** *37/04*
**U.S. Cl. 112—130** **4 Claims**



A cutting mechanism for use on sewing machines having a single unidirectionally, movable cutter blade that cooperates with a fixed or stationary blade, the movable blade being rotatable upon command and being automatically and positively braked after rotation past the cutting position.

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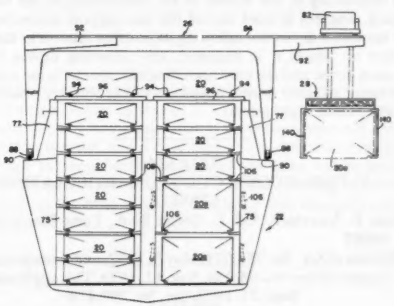
**3,818,852**
**METHOD AND APPARATUS FOR TRANSPORTING FACTORY CONSTRUCTED HOUSING UNITS**
**Eugene C. Lewis, Scotch Plains, N.J.; C. Robert Gottlieb, Mobile, Ala., and Robert H. Macy, Pascagoula, Miss., assignors to Diamondhead Corporation, Mountainside, N.J.**
**Division of Ser. No. 163,935, Sept. 19, 1971. This application Sept. 21, 1972, Ser. No. 291,033**
**Int. Cl. B63b** *25/00*
**U.S. Cl. 114—72** **6 Claims**



A system including method and apparatus for transporting and placing on site foundations factory constructed housing units, completely finished interiorly to provide integral and mechanically operable living spaces ranging in size to a maximum floor area in excess of 4,000 square feet. The system includes coordinated transfer and transporting units, the latter units including both marine vessels and land vehicles, which with the transfer devices are capable of maintaining at all times throughout overall system operation of factory shipping and project phases, a continuous foundation-like support to supply substantially the same measure of structural integrity to the housing unit as that supplied by a permanent foundation. The housing units of which the interior is finished completely

at the factory, including interior painting, carpeting and draperies as well as other operational units such as kitchens, bathrooms, heating and airconditioning units and the like, is, after placement on the permanent site foundation, completed exteriorly by on-site placement of roofs, exterior appendages such as garages, porches, large items of exterior trim, exterior chimneys and the like.

## ERRATUM

For Class 114—126 see:
Patent No. 3,818,959

### 3,818,853
### STOP MEMBERS IN SHIPS

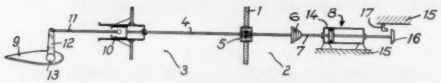
**Paul J. Taboultier, Ville D'Avray, and Rene J. Abgrall, Brest, both of France, assignors to Etat Francais represente Par le Ministre d'Etat charge de la Defense Nationale, Delegation Ministerielle Pour L'Armement Direction Technique Des Constructions Navales (Service Technique des Constructions et Armes Navales), Paris, France**

**Filed Jan. 11, 1972, Ser. No. 216,933**

**Claims priority, application France, Jan. 18, 1971, 71.01520**

**Int. Cl. B63h *25/34***

**U.S. Cl. 114—170** **6 Claims**



This invention relates to a stop permitting the limitation of the angular clearance of the rudder blade of a ship, constituted by a first support piece disposed on one of the two elements, i.e. structure of the ship or one of the members controlling the orientation of the rudder blade, and by a second support piece disposed on the other element, i.e. one of the members controlling the orientation of the rudder blade or structure of the ship, these two support pieces being capable of interfering in the course of the orientation of the rudder blade, wherein at least one of the two support pieces is provided with a device for adjusting its position relative to the element on which it is disposed, this adjusting device being known per se and the corresponding adjustment being capable of being effected during operation of the ship on which said rudder blade is mounted.

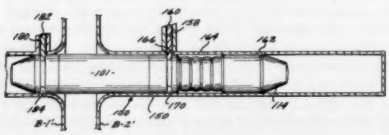
### 3,818,854
### FLEXIBLE CONNECTION FOR ARTICULATING VESSELS

**John E. Marriner, 555 E. Ocean Blvd., Long Beach, Calif. 90802**

**Division of Ser. No. 251,021, May 8, 1972, and a continuation-in-part of Ser. No. 88,938, Nov. 12, 1970. This application Sept. 21, 1973, Ser. No. 399,479**

**Int. Cl. B63b *21/56***

**U.S. Cl. 114—235 R** **6 Claims**



A coupling apparatus interposed between two vessels to connect such vessels in an articulated manner. The vessels may be components of a barge train. The coupling apparatus permits the barges to be individually removed from such train. The apparatus includes one or more resilient posts removably interposed between the vessels. The resiliency of the posts permits the posts to flex and bend for accommodating simultaneous relative movement in roll, pitch, yaw, surge and heave between the vessels resulting from wave action.

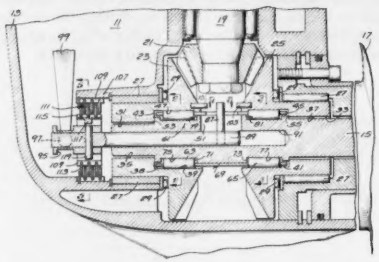
### 3,818,855
### MARINE PROPULSION REVERSING MECHANISM

**William J. Shimanckas, Waukegan, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.**

**Filed Apr. 8, 1971, Ser. No. 132,401**

**Int. Cl. B63h *1/14***

**U.S. Cl. 115—34 R** **25 Claims**



Disclosed herein is a marine propulsion device comprising a vertically tiltable and horizontally swingable drive shaft housing supporting a drive shaft carrying a bevel gear in mesh with two facing co-axially mounted bevel gears located in encircling relation to a propeller carrying shaft, together with means for selectively drivingly connecting the bevel gears and the propeller shaft including a plurality of elongated rollers having axes extending parallel to the rotational axis of the propeller shaft and movable relative to positions of driving engagement between the bevel gears and the propeller shaft, and means for selectively displacing the rollers relative to the driving positions.

### 3,818,856
### REFLECTOR ELEMENT MOUNTING STRUCTURE FOR BICYCLE PEDALS

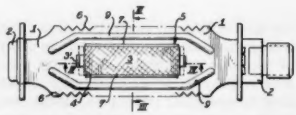
**Hermann Farnung, Fulda, Germany, assignor to Wagner & Co. Fahrzeugteilefabrik, Fulda, Germany**

**Filed June 9, 1972, Ser. No. 261,472**

**Claims priority, application Germany, Nov. 17, 1971, 2157027**

**Int. Cl. B60q**

**U.S. Cl. 116—28 R** **9 Claims**



A reflector element mounting structure for bicycle pedals comprises a pedal tread plate having a cutout opening and a reflector element disposed therein. The reflector element has a shoulder located at each end thereof with each of the shoulders being abutted against the inner side of the tread plate whereby a reflecting surface of the reflector element is ex-

posed through said cutout opening. A holding means is used for biasing the reflector element so that the abutting shoulders of the reflector element are secured against the said inner side of the tread plate. In a specific embodiment, the holding means includes a U-shaped member that extends around the reflector element through the cutout opening on opposing sides of the reflector element and grips the outer side of the tread plate along the periphery of the cutout opening.

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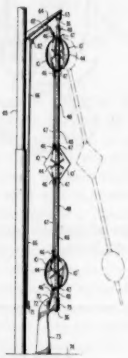
**3,818,857**
**MARITIME DAY SHAPES AND DISPLAY SYSTEM THEREFOR**
**Lucien L. Gouedy, P.O. Box 628, Ponchatoula, La. 70454**
**Filed Aug. 24, 1973, Ser. No. 391,480**
**Int. Cl. G01d** *21/00*
**U.S. Cl. 116—132 R** **9 Claims**



A maritime signaling apparatus for use on a marine vessel comprises collapsible day shapes, a rod pivotally hung from the yardarm of the vessel for displaying the day shapes which are separated a predetermined distance by spacer tubes, and means for automatically opening the day shapes as they are hoisted up the rod by a halyard line. The device is designed such that the day shapes may be supported by the halyard line and rod individually or in combination.

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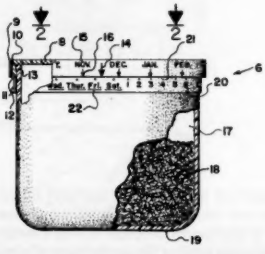
**3,818,858**
**DATABLE FOOD STORAGE CONTAINER**
**Howard J. Kramer, 1528 E. 24th St., Brooklyn, N.Y. 11210, and Ira Klein, 4126 Bedford Ave., Brooklyn, N.Y. 11229**
**Filed Feb. 28, 1972, Ser. No. 229,654**
**Int. Cl. G09f** *9/00*
**U.S. Cl. 116—133** **11 Claims**




A food storage container which in a preferred embodiment includes a lid with a downwardly extending outer flange of annular shape mountable on a vessel having a rounded mouth with substantially upright walls, the outer surface of the annular flange having a series of evenly spaced markers designating each a particular day of the week, and the outer upright wall's outer surface extending annularly around the vessel having a series of time period-interval indicators such as typically and preferably the 31 days of the longest months of the year, with the spaces between the days of the week on the lid flange being of a predetermined dimension such that solely one day of the week mark is alignable with any of the one through thirty-one days of the month on the vessel wall, i.e., at any one time it being impossible for more than one of the respective days of the week being aligned with different ones of the thirty-one days of the month, whereby it is possible always to precisely align a specific day with a specific date without the possibility of confusion insofar as other days being aligned with other dates.

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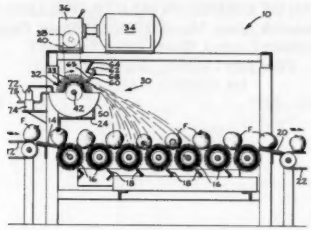
**3,818,859**
**APPARATUS FOR COATING FRUIT**
**Arthur F. Kalmar, 4714 Jurupa Ave., Riverside, Calif. 92506, assignor to FMC Corporation, San Jose, Calif.**
**Division of Ser. No. 181,490, Sept. 17, 1971, abandoned. This application Feb. 6, 1973, Ser. No. 330,133**
**Int. Cl. B05b** *13/02*
**U.S. Cl. 118—24** **3 Claims**



Fruit are sprayed with an ultralow volume spray of a protective coating material by means of a rotary brush, which is arranged to pick up small quantities of the coating material upon the bristles thereof, and a rigid flipper bar, which is arranged to engage the liquid-laden bristles of the brush as the brush rotates to cause the bristles to flip the coating material therefrom in the form of a fine mist spray that descends upon the fruit.

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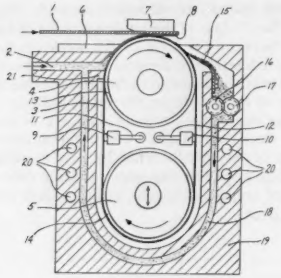
**3,818,860**
**ELECTRICALLY HEATED CONTINUOUS BAND APPLICATOR**
**Hans Waldemar Rebentisch, Frankfurt am Main-Bonames, Germany, assignor to U. S. M. Corporation, Boston, Mass.**
**Filed Mar. 22, 1973, Ser. No. 344,054**
**Claims priority, application Germany, Mar. 22, 1972, 2213974**
**Int. Cl. B05c** *1/14*
**U.S. Cl. 118—202** **2 Claims**

An applicator for material, preferably hot-melt adhesive, has an endless band for heating the material and for applying the heated material to a workpiece. The band has an integral heating element for heating the band and is driven for movement along a longitudinal axis of the band. The material is

received on the band and carried and heated by the band into material applying contact with the workpiece. In one embodiment, the band is magnetized to prevent separation of the material from the band prior to contact of the material with the workpiece.



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**3,818,861**

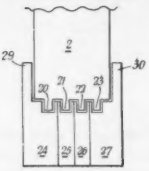
**COATING OF STRIPES ON TO A TRAVELLING WEB**

**George Frederick Albert Marriott Turner, Ilford, England, assignor to Ilford Limited, Ilford, Essex, England**

**Filed July 13, 1972, Ser. No. 271,621**

**Int. Cl. B05c** *1/12, 1/16*

**U.S. Cl. 118—221** **6 Claims**



This invention relates to a to a device for coating stripes on a travelling web from a transfer roller having peripheral rings. The amount of coating liquid to be taken up from the transfer roller is metered by means of an array of rigid adjustable doctor blades.

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**3,818,862**

**PIPE FITTINGS**

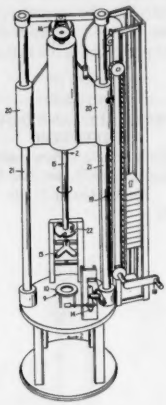
**John Leslie O'Brien; Bryan Finnimore, and Dallas John Arthur Hogg, all of c/o John L. O'Brien & Associates, 70 Derby St., Auburn, New South Wales, Australia**

**Filed Oct. 21, 1971, Ser. No. 191,244**

**Int. Cl. B05b** *13/06*

**U.S. Cl. 118—306** **8 Claims**

Apparatus for lining pipes or fittings with cement or like material including a tool comprising a disc mounted on a spindle. The tool is rotated and reciprocated in the pipe and cement is fed into the pipe and onto the disc and is thrown onto the pipe walls. The effective disc diameter equals the required pipe lining diameter so that in reciprocating in the pipe the disc edge smooths the lining.



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**3,818,863**

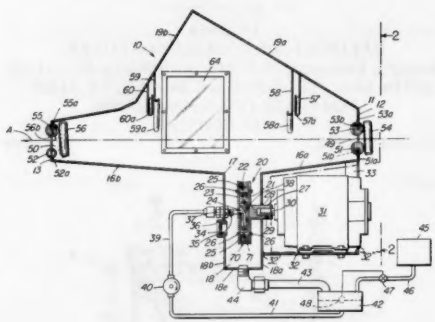
**CENTRIFUGAL SPRAY APPARATUS**

**Richard St. Pierre, and Melvin A. Halpern, both of Charlotte, N.C., assignors to Celanese Corporation, New York, N.Y.**

**Division of Ser. No. 603,372, Dec. 20, 1966, abandoned. This application Feb. 25, 1971, Ser. No. 119,049**

**Int. Cl. B05c** *5/02*

**U.S. Cl. 118—323** **5 Claims**



An improved apparatus for applying liquid state plasticizer to continuous filament tow comprising means for projecting a plurality of plasticizer droplets having a means diameter of 50 to 120 microns against the under side of a web of continuous filament tow at a velocity sufficient to penetrate the tow, thus producing uniform coating of plasticizer on both sides of the tow.

## 3,818,864
## IMAGE DEVELOPING APPARATUS

**John T. Bickmore, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.**

**Filed Sept. 14, 1971, Ser. No. 180,426**
**Int. Cl. G03g** *13/00*
**U.S. Cl. 118—637** **5 Claims**

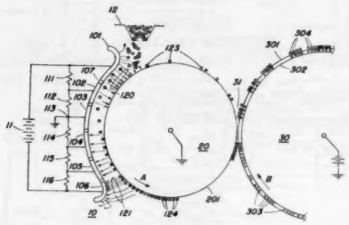
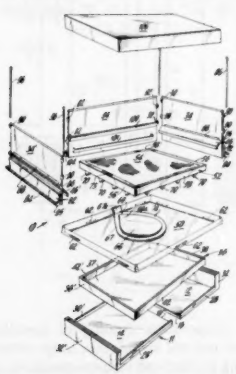


Image developing apparatus therefor is provided in accordance with teachings of the present invention. According to one embodiment of this invention, a surface traverses a uniformly varying electric field whereby electrophotographic developer particles adhering to said surface are removed therefrom in accordance with a first portion of said electric field and further electrophotographic developer particles are uniformly deposited on said surface in accordance with a second portion of said electric field. Said surface may comprise a donor member for selectively transferring the uniformly deposited electrophotographic developer particles to an electrostatic latent image. In another embodiment of the present invention said surface may comprise a photoconductive plate whereby the electrophotographic developer particles are selectively deposited on said photoconductive plate in conformity with the distribution of electrostatic charges thereon. The uniformly varying electric field is produced by variably biassed electrode means.

## 3,818,865
## ANIMAL COMMODE

**Suzanne E. Sinclair, 186 9th Ave., New York, N.Y. 10011**

**Filed Nov. 21, 1972, Ser. No. 308,396**
**Int. Cl. A01k** *29/00*
**U.S. Cl. 119—1** **17 Claims**

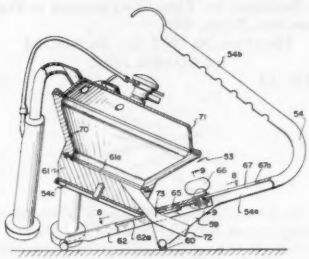


A conveniently assembled and disassembled, portable commode or toilet accessory for domestic pets includes a pair of base members slidably received about and carrying an inner tray frame, a flexible, dished tray removably mounted on and within the tray frame, and a foraminous screen removably mounted above the flexible dished tray. Shield walls provided around the sides of the commode receive animal fluid excretions deposited thereupon and either collect such excretions or transmit them to the screen, where much of the fluid excretions are also deposited directly, from where they pass to the dished tray. Preferably, accumulated solid and fluid wastes on the screen and fluid wastes collected on the shield walls are flush-cleaned onto the dished tray and the latter is, in turn, flush-cleaned into a conventional toilet bowl. Upon disassembly, the elements of the commode can also be readily packed into a single, conveniently portable container or carrying case.

## 3,818,866
## MILKER

**Chester A. Thomas, Lake Forest, Ill., assignor to Babso Bros. Co., Oak Brook, Ill.**

**Division of Ser. No. 663,642, Aug. 28, 1967, abandoned. This application Nov. 10, 1969, Ser. No. 875,500**
**Int. Cl. A01j** *9/08*
**U.S. Cl. 119—14.1** **4 Claims**



A milker unit for a carry-away milking system with a milk receiving chamber beneath the cow, having a height to accommodate low udders. The chamber has a lid to which the teat cups are connected, the chamber tapering inwardly toward the bottom to a base. The over-all height of the chamber is approximately 5¼ inches. Two forms of milker are shown. One, mounted on the stall structure, is carried in a cantilever arm having a downwardly extending portion connected with the lower part of the chamber through a rocker connector permitting limited movement about an axis parallel with the length of the cow being milked. In the other form, carried from a surcingle during milking, the milker includes a stand for supporting the apparatus on a surface when not in use. The stand has a movable leg which is adjustable between an extended support position with the teat cups above the surface and a retracted milking position in which the height of the milker is minimized.

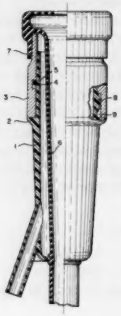
## 3,818,867
## TEAT CUP

**Poul Strange-Hansen, Horne, DK-Varde, Denmark**

**Filed Apr. 6, 1973, Ser. No. 348,595**
**Int. Cl. A01j** *5/06*
**U.S. Cl. 119—14.47** **1 Claim**

A teat cup adapted to fit on milk cows and used in connection with milking machines comprising a transparent plastic tubular member with an annular metal body that fits loosely

over the tubular member and is held axially in place between a shoulder on the tubular member and a reverse collar part of



the rubber liner. Leakage is prevented by use of an O-ring and relative rotation is prevented by a boss and slot between the plastic member and the metal body.

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**3,818,868**

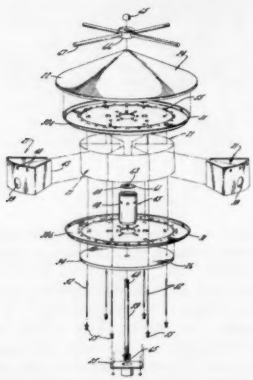
**BIRD HOUSE**

**Robert R. Boehland, Jr., Linn, Wis., assignor to Feather Hill Industries, Inc., Zenda, Wis.**

**Filed Mar. 30, 1973, Ser. No. 346,704**

**Int. Cl. A01k** *31/00*

**U.S. Cl. 119—23** **12 Claims**



A bird house includes a series of compartments formed of disposable material and sandwiched between two vertically spaced platforms. Connecting means normally holding the platforms and compartments together are releasable to permit the house to be disassembled for cleaning, the old compartments being discarded and replaced with new ones.

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**3,818,869**

**METHOD OF OPERATING A COMBINED GASIFICATION-STEAM GENERATING PLANT**

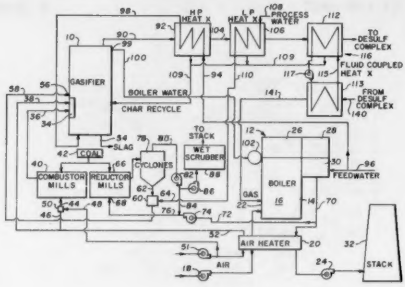
**Henry John Blaskowski, West Simsbury, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.**

**Filed Jan. 2, 1973, Ser. No. 320,365**

**Int. Cl. C10j** *1/00*

**U.S. Cl. 122—5** **9 Claims**

A steam generating plant is provided which includes an entrainment, slagging, air blown atmospheric pressure coal gasifier, a heat recovery train, atmospheric pressure desulfurization and a steam generator designed to burn the low Btu fuel gas produced in the gasifier. Heat recovered from the gas produced in the gasifier is used to raise the temperature of a




portion of the steam generator feedwater, generate steam for use in the gasifier, and to reheat the fuel gas following desulfurization. Heat recovered from boiler flue gas is utilized in drying and preheating the reactants to the gasifier.

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**3,818,870**

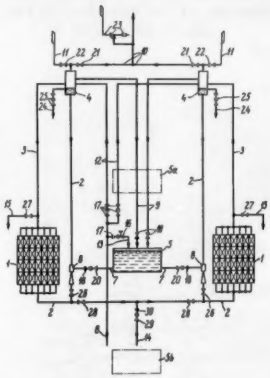
**SYSTEM FOR EVAPORATIVE COOLING OF METALLURGICAL UNITS**

**Sergei Mikhailovich Andoniev, Prospekt Pravdy, 5, kv. 60; Leonid Borisovich Zilberman, Ekonomicheskaya ulitsa, 1 a, kv. 12; Gennady Alexandrovich Kudinov, Prospekt Gagarina, 8 mikroraion, 32, kv. 203; Dorina Borisovna Kutsykovich, Prospekt Lenina, 39, kv. 54; Vladimir Afanasievich Lukashev, Ulitsa Tankopia, 12, kv. 25; Jury Borisovich Raikovsky, Prospekt Lenina, 11, kv. 16, and Oleg Vladimirovich Filipiev, Prospekt Pravdy, 5, kv. 41b, all of Kharkov, U.S.S.R.**

**Filed July 10, 1972, Ser. No. 270,286**

**Int. Cl. F22b** *37/26*; **F22d** *7/04*

**U.S. Cl. 122—7 R** **5 Claims**



A system for evaporative cooling of metallurgical units comprising closed natural circulation loops which consist of the elements being cooled and steam separators communicating with the elements being cooled via pipelines adapted for feeding water and discharging a steam-water mixture, provision is also made for water storage vessels adapted for feeding the device with the water, the vessels being arranged below

the steam separators and connected by pipelines with a water supply and a jet pump introduced into the water feed pipeline of each circulation loop, the vessel and the jet pump being mounted so as to enable the pump to draw in the water into the circulation loop to offset its losses in the course of operation of the device, the present invention is directed toward a reduction in the cost of manufacture and operation of the device for evaporative cooling of metallurgical units.

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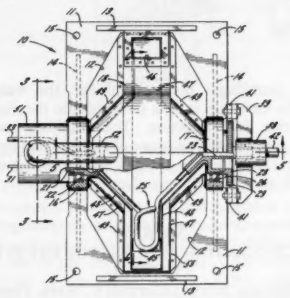
**3,818,871**

## ROTARY BOILER

**Chadwell O'Connor, 2024 Galaxy Drive, Newport Beach, Calif. 92660**

**Filed Apr. 16, 1973, Ser. No. 351,316**
**Int. Cl. F22b** *31/00*
**U.S. Cl. 122—11** **5 Claims**



A boiler in which a plurality of generally A-shaped tubes connect to, and are rotatably driven with, an annular hub and a steam discharge pipe in a generally circular chamber. Water and fuel for combustion are introduced through the hub. The tubes act like an impeller fan drawing air for combustion through the hub. The chamber is double walled to define an air cooling jacket and air is drawn through the double wall before being directed to the hub.

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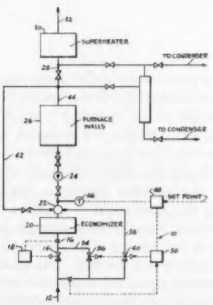
**3,818,872**

## ECONOMIZER BYPASS FOR INCREASED FURNACE WALL PROTECTION

**William Harold Clayton, Jr., Windsor, Conn., and Wolfram Gerhard Schuetzenduebel, Santa Fe, Calif., assignors to Combustion Engineering Inc., Windsor, Conn.**

**Filed June 29, 1973, Ser. No. 375,219**
**Int. Cl. F22b** *29/12*
**U.S. Cl. 122—406 S** **6 Claims**




An arrangement for protecting, at low loads, the furnace walls of a once-through steam generator system, having a recirculation loop, by increasing the mass flow of the working fluid flowing through the furnace wall tubes. A bypass for incoming feedwater is provided around the economizer allowing a lower temperature fluid to be delivered to and mixed with the fluid from the recirculation loop lowering the temperature of the fluid mixture. This results in a decrease in the specific volume of the mixed fluids; and since the recirculating pumps in the recirculation loop supply almost the same volumetric flow under all loads to the furnace wall tubes, the lower specific volume of the mixed fluid delivered to the pumps will yield a greater mass fluid flow to the furnace walls. The increased mass flow in turn results in improved heat transfer characteristics within the furnace walls thus reducing the likelihood of furnace wall damage due to overheating.

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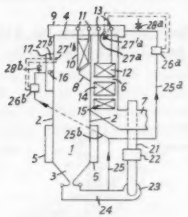
**3,818,873**

## PRESSURE SEAL

**Tsuneo Watanabe, and Akinori Iwai, both of Hiroshima, Japan, assignors to Babcock & Wilcox Limited, London, England**

**Filed June 20, 1972, Ser. No. 264,675**
**Int. Cl. F22b** *37/22*
**U.S. Cl. 122—494** **3 Claims**



An arrangement for eliminating leakage of ash and combustibles bearing flue gases from within a vapor generator gas pass enclosure to a compartment situated outside of the enclosure including the means for maintaining a higher flue gas pressure in the compartment as compared to the pressure within the gas pass enclosure.

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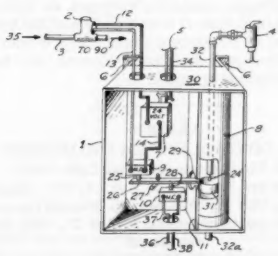
**3,818,874**

## SAFETY SWITCH ASSEMBLY FOR A RELIEF VALVE

**Peter Tria, 166 Grove St., Windsor Locks, Conn. 06096**

**Filed Apr. 2, 1973, Ser. No. 347,333**
**Int. Cl. F22b** *37/42*
**U.S. Cl. 122—504** **10 Claims**




The within device is concerned with a safety switch for a relief valve which is comprised of mechanical and electrical components. The purpose of the switch is to turn off a boiler

when a relief valve fails to function. The relief valve permits excessive steam to be released from the boiler and prevents explosion of the boiler. The within device has a lever arm mounted on a fulcrum. There is a cup at one end of the lever arm. The cup is mounted beneath a pipe which is connected to the relief valve. There is above the lever arm a normally open switch connected to a circuit that controls the flow of a water supply. There is connected below the lever arm another switch which is connected to the energy source that controls the operation of the boiler. When the cup fills up with water from the pipe connected to the deflective relief valve, the weight of the cup will cause the lever arm to tilt on its fulcrum. A normally open switch above the lever arm will be closed by the lever arm to turn off the water supply. The normally closed switch beneath the lever arm will open because of the pressure of the lever arm caused by the water in the cup and the electrical source that operates the controls of the gas or oil burner will be turned off since the circuit will be opened and the source of fuel to the burner will cease to burn.

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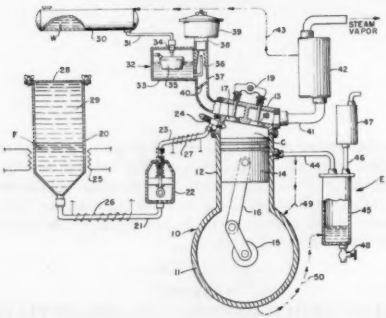
**3,818,875**

## POLLUTION-FREE COMBUSTION ENGINE AND UNIQUE FUEL THEREFOR

**Edward H. Phillips, 30 King George Rd., Warren, and Edwin D. Phillips, 170 Albert St., North Plainfield, both of N.J. 07060**

**Filed Nov. 30, 1972, Ser. No. 310,987**
**Int. Cl. F02b** *1/00, 51/00*
**U.S. Cl. 123—25 E** **13 Claims**




A pollution-free combustion engine and method of operating same, and a unique fuel, in which the working fluid for the engine is a liquid alkali metal reacted with water, the reacted alkali metal and water producing hydrogen, an hydroxide of the alkali metal, and heat, at least a portion of the hydroxide being exhausted to atmosphere where it reacts with carbon monoxide to produce a harmless carbonate, said fuel thus resulting in a nonpolluting engine.

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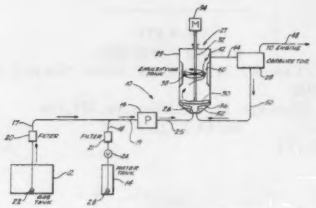
**3,818,876**

## SMOG CONTROL SYSTEM AND METHOD

**Maarten Voogd, 918 Patomar Rd., Ojai, Calif. 93023**

**Continuation of Ser. No. 172,088, Aug. 16, 1971, abandoned. This application May 29, 1973, Ser. No. 364,646The portion of the term of this patent subsequent to Sept. 21, 1988, has been disclaimed.**
**Int. Cl. F02m** *25/04*
**U.S. Cl. 123—25 R** **5 Claims**

A fuel system for reducing nitrogen oxides and carbon monoxide in the exhaust gas emissions of an internal combustion engine includes a storage tank for gasoline and a dissolved emulsifying agent, a storage tank for deionized water, and means for pumping controlled volumes of the gasoline and emulsifying agent and the water to an emulsifying chamber and thence to the engine. In one form of the invention, rotary stirring means within the emulsifying chamber emulsify the water in gasoline, and the emulsion is then introduced into the engine carburetor. In another form of the invention, a centrifugal pump emulsifies the water in the gasoline. The emulsion is then pumped into the engine cylinders by direct fuel injection. The emulsion substantially reduces the reaction temperature of gasoline and air in the engine cylinders, and thereby reduces the formation of nitrogen oxides which are a major cause of air pollution.



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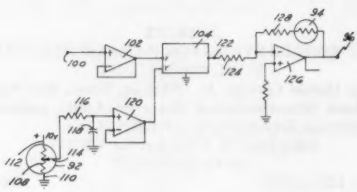
**3,818,877**

## SIGNAL GENERATING PROCESS FOR USE IN ENGINE CONTROL

**Carlos M. Barrera, Detroit; Clarence C. Stark, Plymouth, and Frederick L. Zeisler, Livonia, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.**

**Filed Aug. 24, 1972, Ser. No. 283,604**
**Int. Cl. F02b** *3/00*
**U.S. Cl. 123—32 EA** **1 Claim**

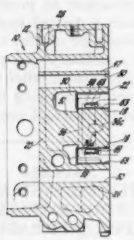


Described is a process for generating a signal for use in engine control. The process generates an electrical signal indicative of the amount of air entering a spark ignition internal combustion chamber and has a conduit for conveying air thereto. The process includes the step of partially obstructing the flow of air through the conduit during operation of the engine thereby causing the formation of vortices in the air flowing through the conduit. An electrical signal is generated, and this electrical signal is modulated at a rate proportional to the rate at which the vortices are formed. The characteristics of the modulated electrical signal are indicative of the volumetric air flow rate. This signal or a signal derived therefrom may be adjusted to provide a signal indicative of the mass rate of air flow through the conduit. The mass air flow signal is applied to means for controlling the amount of fuel metered to the engine.

## 3,818,878
## IMPROVED CYLINDER HEAD COOLING

Karl Zaruba, Detroit, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 23, 1973, Ser. No. 353,587
Int. Cl. F02f 1/34
U.S. Cl. 123—41.82 3 Claims



A cylinder head assembly for an internal combustion engine includes lower and upper decks and connecting walls defining a coolant chamber with a plurality of exhaust ports for each cylinder extending through the coolant chamber to the lower deck. A longitudinally extending partial intermediate deck intersects the exhaust port walls and partially defines upper and lower sections of the coolant chamber. Connecting walls enclose portions of the lower section of the chamber intermediate the exhaust ports of adjacent cylinders. Adequate support for cores used in casting the main body of the cylinder head is provided through openings connecting the enclosed portions of the coolant chamber with the remaining lower portions and upper section. At assembly, tubular inserts are installed in these openings to block communication of the enclosed chamber portion with the remaining portions and to direct coolant flow into the enclosed portion from an external supply. The arrangement forces coolant to flow between the adjacent exhaust ports and around the fuel injector tube at each cylinder position before passing to other portions of the coolant chamber.

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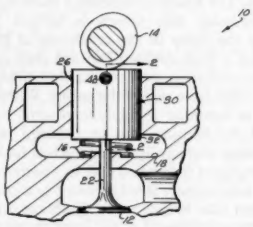
## 3,818,879
## MECHANICAL VALVE LASH ADJUSTER

Gerald D. Line, Saginaw, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Apr. 1, 1971, Ser. No. 130,362
Int. Cl. F01l 1/14, 1/20, 1/24
U.S. Cl. 123—90.54 4 Claims

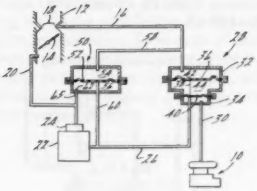


A valve gear lash adjuster includes a body having an inclined bore therein and a tapered pin in said bore for defining with said body a pair of parallel, adjustable surfaces.

## 3,818,880
## EXHAUST GAS RECIRCULATION CONTROL FOR INTERNAL COMBUSTION ENGINES

Gary D. Dawson, Rochester, and Robert S. Harris, Washington, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Aug. 2, 1972, Ser. No. 277,219
Int. Cl. F02m 25/06
U.S. Cl. 123—119 A 8 Claims



An exhaust gas recirculation (EGR) control arrangement for internal combustion engines incorporating vacuum relief means for dumping an output EGR signal, which ordinarily maintains an EGR valve in an "open" condition, whenever a venturi control signal achieves a predetermined relationship to the value of engine manifold vacuum, thereby causing the EGR valve to close.

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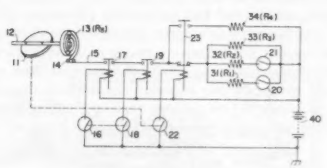
## 3,818,881
## ELECTRICALLY CONTROLLED AUTOMATIC CHOKE OF A CARBURETOR FOR AN INTERNAL COMBUSTION ENGINE

Yukio Hosho, and Takeshi Atago, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 21, 1973, Ser. No. 334,430
Claims priority, application Japan, Feb. 21, 1972, 47-17204
Int. Cl. F02d 11/08; F02m 1/10, 23/04
U.S. Cl. 123—119 F 10 Claims



A coiled bimetal element for rotationally moving a choke valve of an electrically controlled automatic choke is directly heated through an electric current from a battery, and the current flowing through the bimetal is adjusted depending upon the atmospheric temperature and the engine temperature. Further, the current is reduced to a small amount after the choke valve is fully open.

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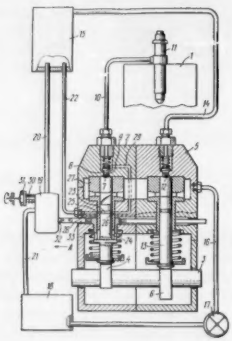
## FUEL SYSTEM OF INTERNAL COMBUSTION ENGINE

Oleg Borisovich Leonov, Ladozhskaya ulitsa, 2/37, kv. 20; Viktor Viktorovich Arapov, ulitsa Chistye Prudy, 11, kv. 52, both of Moscow; Vladimir Grigorievich Pavljukov, ulitsa Serova, 5, kv. 8, Zhukovsky Moskovskoi oblasti; Nikolai Nikolaevich Patrakhaltsev, bulvar Yanisa Rainisa, 18, korpus 1, kv. 99, Moscow; Nikolai Nikolaevich Manuilov, Leninsky prospekt, 3, kv. 163, Moscow, and Nikolai Konstantinovich Soldatov, Dnepropetrovskaya ulitsa, 5, korpus 4, kv. 178, Moscow, all of U.S.S.R.

Filed Mar. 27, 1972, Ser. No. 238,507
Int. Cl. F02m 41/16
U.S. Cl. 123—139 AS 4 Claims



A fuel system of an internal combustion engine comprising a high-pressure pump with a governing element in the form of a rack, and a discharge valve. Said high-pressure pump is connected with a closed-type fuel injector by a high-pressure pipe. For maintaining a high initial pressure in said pipe, it communicates with an accumulator by a pipe via a fuel distributor in the form of a groove and inlet and outlet holes. Pressure in the accumulator is built up by an auxiliary pump. The required high pressure in the accumulator is maintained by a controllable reducing valve communicating with said accumulator.

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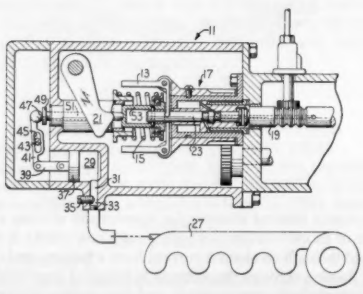
## ISOCHRONOUS GOVERNOR

Stephen F. Glassey, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 845,348, July 28, 1969. This application Nov. 26, 1971, Ser. No. 202,254
Int. Cl. F02d 1/04
U.S. Cl. 123—140 R 3 Claims



An isochronous governor having structure which provides a pressure force to compensate for the relative decrease of governor spring force with respect to flyweight force as engine load increases, thereby allowing the engine controlled by the governor to maintain operation at a constant speed under varying load high idle, no load speed, at all times. In a turbocharged engine, inlet manifold air pressure may be utilized to produce the force. The air pressure directly related to engine load acts upon a small piston and the resulting pressure force, approximately equal to the difference between the spring and the flyweight forces as engine load increases, acts upon the governor structure to properly position the fuel pump rack to maintain a desired engine speed. Engine oil pressure may alternatively be utilized to provide the required pressure force, and a second lever, positioned by the fuel pump rack, serves to preload a relief valve in the engine oil pressure system, thereby controlling the oil pressure in the system as a function of the fuel rack position.

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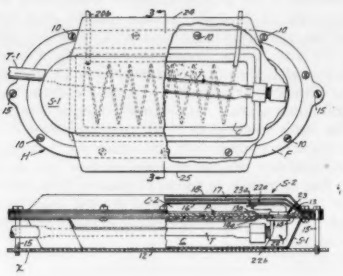
## CATALYTIC HEATER AND SYSTEM FOR PREHEATING INTERNAL COMBUSTION ENGINES BY TRANSMISSION AND INFRARED RADIATION

Emil Pfender, West St. Paul, Minn., assignor to Cordless Car Heater Co., St. Paul, Minn.

Filed Nov. 2, 1972, Ser. No. 303,281
Int. Cl. F02n 17/02; F23q 7/06, 11/00
U.S. Cl. 123—142.5 R 11 Claims

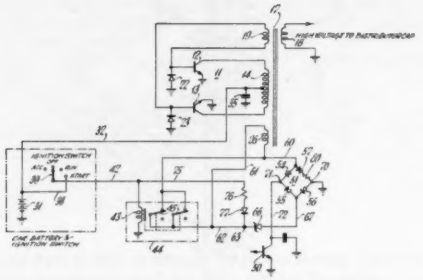


A catalytic heater and control system is provided for efficiently preheating internal combustion engines in cold weather to facilitate starting. Heat is applied by transmission, by infrared radiation and by convection to the fluid contained within a heat-receptive housing (preferably the crankcase) of the engine. The heater comprises a shallow housing having a heat-transmissive side which is affixed in contact with preferably the sump of the crankcase of the engine, which housing has a heat-shielded forward shell or side and within which core defines a shell combustion chamber adjacent the attached conductive side of the casing. Within the combustion chamber is mounted a catalytic reactor extending longitudinally of the housing with an exposed substantial surface thereof facing rearwardly. Hydrocarbon fuel is obtained from the fuel source of the engine and, by control, is admitted intermittently in extremely small amounts to a conductive generating or vapor tube having vapor discharge orifice or discharge means disposed adjacent to the catalytic element. The system also includes an electrical heating coil for starting the heater or burner and which is preferably embedded in a pad upon which is superimposed the catalytic material, usually a pigment or sheeting carrying impregnated platinum or the like. The control system includes means for energizing the heating coil for only a short period for starting of the combustion operation and generation of the hydrocarbon gas or vapor.

## 3,818,885
## HIGH-FREQUENCY CONTINUOUS-WAVE IGNITION SYSTEM

Robert E. Canup, Chester, Va., assignor to Texaco Inc., New York, N.Y.

Filed Feb. 20, 1973, Ser. No. 333,856
Int. Cl. H01t *15/02*; F02p *3/06, 5/04*
U.S. Cl. 123—148 5 Claims

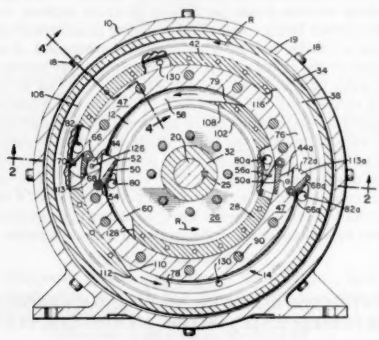


A high-frequency continuous-wave ignition system for internal combustion engines. It employs a unitary magnetic circuit in a square-wave oscillator. Starting and stopping the oscillator is controlled by a winding coupled to the magnetic circuit. A circuit including this control winding has a full-wave AC short-circuit connection for stopping the oscillator between sparking intervals. However, a predetermined half-wave path in the short circuit has a greater impedance than the other half-wave path. This acts so that the magnetic circuit is always set in a given state as the oscillator is stopped. As a result it ensures instant starting of the oscillator at the beginning of each sparking interval.

## 3,818,886
## ROTARY INTERNAL COMBUSTION ENGINE

Zdzislaw M. Blaszczynski, 174 Pleasant View Rd., Thomaston, Conn. 06787

Continuation-in-part of Ser. No. 230,783, March 1, 1972, abandoned. This application May 4, 1973, Ser. No. 357,350
Int. Cl. F02b *53/08*
U.S. Cl. 123—8.41 30 Claims

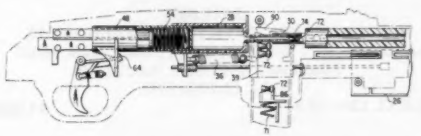


A rotary-piston internal combustion engine having an annular compression cylinder and a separate annular combustion cylinder with one or more passages interconnecting the two cylinders and with valves dividing the compression cylinder into intake and compression chambers and the combustion cylinder into combustion and exhaust chambers. At least one piston is mounted within each cylinder and is rigidly mounted on a drive shaft common to the pistons for both cylinders, such that it revolves within its corresponding cylinder. The piston in the compression cylinder compresses a charge of gaseous fuel mixture into the passage between the cylinders, from which the gases expand into the combustion cylinder with combustion taking place just as the trailing end of the combustion piston passes the outlet from the pressure passage. In addition to forming the chambers within the cylinders, the valves are driven by the pistons into passage-closing relation with the inlet and outlet for the pressure passage, such inlet and outlet being within the walls of the compression and combustion cylinders, respectively. Movement of such valve into its chamber-forming position takes place as the trailing end of the corresponding piston moves downstream, permitting the valve to be driven out of its passage-closing position and back into its chamber-forming position.

## 3,818,887
## TOY AIR GUN

Kenzo Akiyama, and Takao Matsumoto, both of Tokyo, Japan, assignors to Tomy Kogyo Co., Ltd., Tokyo, Japan

Filed Apr. 17, 1973, Ser. No. 351,972
Claims priority, application Japan, May 31, 1972, 47-54200
Int. Cl. F41b *11/00*
U.S. Cl. 124—15 5 Claims



A toy air gun featuring a magazine detachably mounted to the gun for sequentially urging pellets into a chamber contained therein, a hollow cylinder provided at the forward end thereof with a nozzle and being operatively mounted for sliding movement within the gun between a first position wherein the nozzle is positioned rearwardly of that part of the chamber into which the pellets are fed and a second position wherein the nozzle extends within the barrel of the gun, the cylinder normally being urged to its second position by a spring, a piston mounted within the cylinder, the inoperative position of a trigger mechanism formed as a part of the gun holding the piston in its rearward position, the piston normally being urged to move forwardly within the cylinder and a slide mechanism operatively mounted to the gun such that as the child moves same rearwardly, the cylinder is caused to move rearwardly eventually contacting and forcing the piston rearwardly to its cocked position, after which the cylinder returns to its forward position moving a pellet introduced from the magazine into the chamber of the gun, after which actuation of the trigger mechanism releases the piston to move forwardly within the cylinder forcing air normally contained therein outwardly through the nozzle causing the pellet to be propelled out of the barrel of the gun.

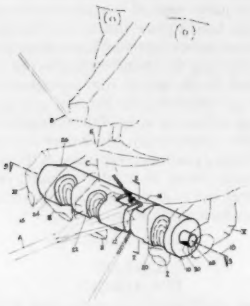
## 3,818,888
## BOWSTRING RELEASE

William W. Keeney, 109 Walgrove Rd., Reisterstown, Md. 21136, and Henry E. Bolling, 836 W. 35th St., Baltimore, Md. 21211

Filed Aug. 29, 1973, Ser. No. 392,499
Int. Cl. F41b *5/00*
U.S. Cl. 124—35 A 15 Claims

A bowstring release having a housing with a transverse-slot in its radial wall communicating with a longitudinal bore

passing therethrough. The release has an axially movable plunger in the bore which has an "L" shaped slot forming a nib exposed at, and coacting with the transverse-slot to retain a bowstring passing therethrough. One end of the plunger



protrudes from the housing bore as a trigger a spring opposes and a screw limits motion of the plunger. The radial wall has a flat portion that supports an arrow. The transverse-slot guides a bowstring on release of an arrow.

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**3,818,889**

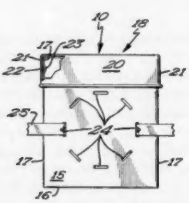
**FOOD HEATING DEVICE FOR SNOWMOBILES**

**Arnold Lillo, Rt. 1 Box 186A, Good Thunder, Minn. 56037**

**Filed June 21, 1973, Ser. No. 372,285**

**Int. Cl. F24c** *9/00*

**U.S. Cl. 126—19.5** **4 Claims**



A food heating device for snowmobiles includes a generally rectangular-shaped receptacle having a closure member for opening and closing the receptacle. The rear wall of the receptacle has a plurality of pairs of slots therein, and an elongate flexible metallic strap which extends through a selected pair of slots and is applied to a snowmobile muffler. Suitable strap tightening means are provided for tightening the strap on the snowmobile muffer so that the rear wall of the receptacle is urged tightly against the wall of the muffler. The receptacle is quickly heated during operation of the snowmobile to heat and/or cook food within the receptacle.

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**3,818,890**

**VENTILATED WINDOWED OVEN DOOR**

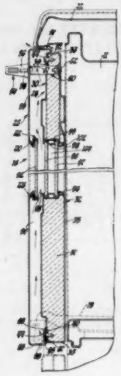
**Jesse L. Evans, Tipp City, and Eugene L. Hecker, Dayton, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.**

**Filed July 16, 1973, Ser. No. 379,725**

**Int. Cl. F23m** *7/00*

**U.S. Cl. 126—200** **2 Claims**

An oven door structure includes an outer pan-shaped cover panel supported in spaced nested relation on a box-casing to provide an air-wash passageway. The box-casing comprises an inner pan-shaped panel having L-sectioned return flanges ex-



tending on all four sides for abuttingly receiving a relatively planar face panel to be threadably fastened to the return flange portion of the L-sectioned flanges.

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**3,818,891**

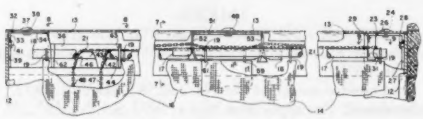
**FIRE SCREEN ASSEMBLY**

**Robert C. Dew, New Albany, Ind., assignor to Stratton & Terstegge Co., Inc., New Albany, Ind.**

**Filed Oct. 18, 1973, Ser. No. 407,609**

**Int. Cl. F24c** *15/36*

**U.S. Cl. 126—202** **9 Claims**



A first bracket at one side of a fire screen assembly has a depending arcuate guide, as viewed in cross section, with its outer surface being convex and engaging an intermediate portion of a flexible pull member passing therearound. A second bracket at the other side of the screen assembly carries inner and outer spaced apart arcuate guides, as viewed in vertical cross section, with the upper surface of each being convex and engaging an end portion of the pull member with one end portion extending over the inner guide and then between the spaced guides and the other end portion extending over and then downwardly alongside the outer guide. The second bracket is connected to the adjacent end portion of a support rod which extends alongside the spaced apart guides and limits lateral movement of the end portions of the pull member.

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**3,818,892**

**SYSTEM FOR REMOVING SNOW AND ICE FROM AND FOR SUBSEQUENTLY DRYING AN ATHLETIC PLAYING SURFACE**

**Henry Von Kohorn, 22 Perkins Rd., Greenwich, Conn. 06830**

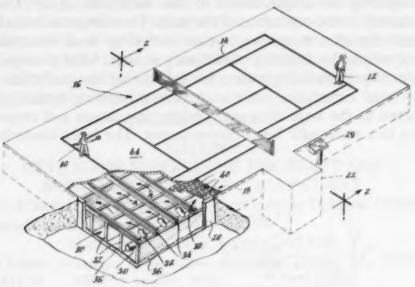
**Filed Sept. 20, 1973, Ser. No. 399,171**

**Int. Cl. F24j** *3/02*

**U.S. Cl. 126—271.1** **11 Claims**

A system is provided for removing snow and ice from and for subsequently drying an athletic playing surface such as a

tennis court, basketball court, or the like. The system includes a porous playing surface mounted above a plenum chamber. A heating unit or furnace is associated with the chamber to introduce hot gases in the chamber under pressure sufficient to



cause them to pass up through the porous surface. These hot gases then serve to melt the snow and dry the surface. The openings in the porous surface should be large enough to permit up-flow of the gases and drainage of the melted snow, but small enough so as to not adversely affect play on the surface.

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**3,818,893**

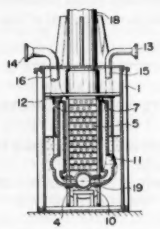
**SUBMERGED COMBUSTION TYPE VAPORIZER**

**Yasuo Kataoka, No. 45 Daina Taihei Building 11-20, Kohroen, Settsu, Osaka; Morio Shimizu, 176 1-chome, Kitazona, Hyogo, Itami, and Tomoo Watanabe, 3-27-1, Tokiwacho, Naku-ku, Kanagawa, Yokohama, all of Japan**

**Filed Aug. 7, 1973, Ser. No. 386,349**

**Int. Cl. F24h** *1/20*

**U.S. Cl. 126—360 A** **4 Claims**



In this invention, many through holes are made on the inside surfaces opposed to a heat exchanging means of sparge boxes arranged on both sides of said heat exchanging means so that a necessary and sufficient quantity of heat transmitted to a fluid passing through tubes for exchanging heat of said heat exchanging means may be guaranteed and it may be possible to feed an optimum heat energy.

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**3,818,894**

**LARYNGEAL IMPLANT**

**Otto Wichterle, Praha, and Zdenek Kresa, Plzen, both of Czechoslovakia, assignors to Ceskoslovenska akademie ved, Praha, Czechoslovakia**

**Filed Jan. 3, 1972, Ser. No. 215,126**

**Claims priority, application Czechoslovakia, Jan. 22, 1971, 469-71**

**Int. Cl. A61b** *19/00*

**U.S. Cl. 128—1 R** **7 Claims**

This invention relates to an implant for surgical purposes and which is especially useful for the operative treatment of afflicted vocal cords, as well as to the method for its production. The implant is made from water-swellable and physiologically inert material, such as a synthetic cross-linked hydrophilic gel, and has in a dry state, when it is ready for use in an operation, the shape of a straight or bent stick provided with a sharp, pointed tip. The implant body except the tip may contain physiologically inert plasticizers.

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**3,818,895**

**OLIGAEMIC SHOCK ASSESSMENT APPARATUS**

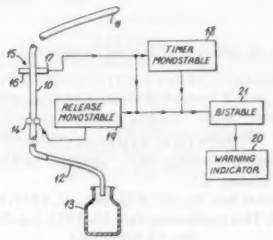
**John Stewart Simpson Stewart, 50 The Common, Parbold, Wigan, England**

**Filed Oct. 31, 1972, Ser. No. 302,420**

**Claims priority, application Great Britain, Nov. 1, 1971, 50769/71; Dec. 17, 1971, 58885/71**

**Int. Cl. A61f** *5/44;* **A61b** *10/00*

**U.S. Cl. 128—2 F** **6 Claims**




The onset of oligaemic shock is assessed by monitoring urine flow and, additionally, deep body temperature. Urine flow is channelled by a bladder catheter to a tube which is repeatedly occluded for intervals terminated by accumulation of a predetermined quantity of urine or a time period, which quantity and period together represent a normal flow rate. A warning is given if the period terminates before the quantity is accumulated, thus representing abnormally low flow rate. Deep body temperature can be additionally monitored by provision of a thermoelectric transducer at the tip of the bladder catheter and, again, warning given for an abnormal value.

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**3,818,896**

**INFLATABLE PATIENT ENCLOSURES**

**David W. Deaton, Dallas, Tex., assignor to Medical Concepts, Inc., Irving, Tex.**

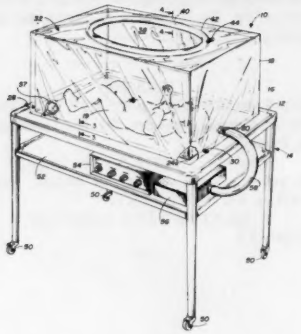
**Division of Ser. No. 17,688, March 9, 1070, Pat. No. 3,710,791. This application Oct. 17, 1972, Ser. No. 298,384**

**Int. Cl. A61g** *11/00*

**U.S. Cl. 128—1 B** **11 Claims**

An inflatable housing includes bottom and side portions adapted to enclose a volume of atmosphere for use as an incubator or an oxygen tent. The side portions of the housing are constructed from spaced apart flexible sheets to form air chambers which extend over a substantial area of the side portions. When the air chambers are inflated, the side portions become self-supporting and the air chambers form a confined air barrier about the volume of atmosphere surrounding the patient. For safety purposes in certain embodiments, at least two independent air chambers are provided around the housing, each of the independent air chambers having the capacity when inflated to maintain the side portions in an upright position. In other embodiments, a top portion has an opening defined therein, with an air chamber ring disposed about the

periphery of the opening. The air chamber ring when inflated is capable of maintaining the shape of the opening regardless



of the state of inflation of the air chambers in the side portions.

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**3,818,897**

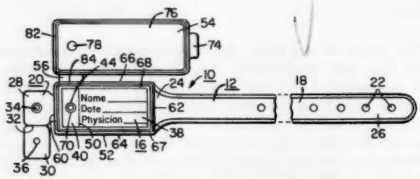
**IDENTIFICATION SYSTEM**

**Ward C. Smith, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.**

**Division of Ser. No. 209,875, Dec. 20, 1971, Pat. No. 3,380,213. This application Feb. 20, 1973, Ser. No. 334,013**

**Int. Cl. G09f** *3/14*

**U.S. Cl. 128—2 F** **1 Claim**




In an identification assembly of the type having an elongated flexible band with fastening means for locking to the limb of a patient wherein the improvement comprises the addition thereto of an identification label dispenser holding a plurality of patient identification labels, with the dispenser including means for holding the labels so that no label can be added without resultant indication thereof. All but one of the labels are removably held and removal thereof requires a pulling force which results in tearing of the label (in the vicinity of the holding means), with the securing of the pulling force insuring that no tampering has occurred. A method of correlating the identity between the patient and specimens taken therefrom sets forth the dispenser-attaching, specimen-drawing, label-removing and label-attaching steps required in carrying out this method.

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**3,818,898**

**ECHO-ENCEPHALOGRAPHIC APPARATUS**

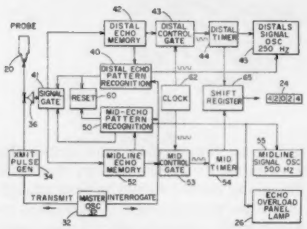
**James Bryan Williams, Lexington, Mass., assignor to Diagnostics Electronics Corporation, Lexington, Mass.**

**Continuation-in-part of Ser. No. 19,815, March 16, 1970, abandoned. This application June 7, 1972, Ser. No. 260,496**

**Int. Cl. A61b** *10/00*

**U.S. Cl. 128—2 V** **10 Claims**

Echo-encephalographic apparatus for location of the centerline of the brain relatively to the centerline of the head including a sonic pulse transducer adapted to be applied to one side of the head and a sonic pulse generator connected thereto for providing a sonic pulse for producing echoes from the opposite side of the head and from the centerline of the brain. A computer is connected to the transducer for automatically computing the displacement of the centerline of the brain relatively to the centerline of the head. The computer includes head dimesion measuring means including head dimension gate means for masking preliminary echoes, head dimension centerline calculating means for calculating the centerline of the head dimension, brain centerline measuring means connected to the head dimension measuring means and responsive to a successful head measurement. The brain centerline




measuring means includes brain centerline gate means connected to the head dimension centerline calculating means and responsive to echoes within a predetermined displacement of the centerline of said dimension of the head and displacement calculating means connected to the head dimension and brain centerline measuring means providing a displacement signal and including display means for displaying the displacement. The head dimension measuring means includes head measurement signal means for signalling a successful measurement of the head and the brain centerline measuring means includes brain centerline signal means for signalling a successful measurement of the distance to the centerline of the brain.

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**3,818,899**

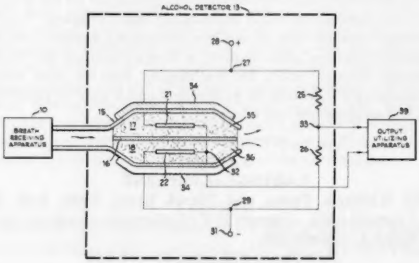
**BREATH TESTING SYSTEM WITH INCREASED SENSITIVITY**

**Harry J. Venema, Wheaton, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.**

**Filed July 3, 1972, Ser. No. 268,340**

**Int. Cl. A61b** *5/00*

**U.S. Cl. 128—2 C** **1 Claim**




Increased sensitivity to alcohol content of a subject's breath is obtained in a catalytic oxidation or combustion detector by flowing a breath sample through a heated chamber containing a maze of substrate elements, such as fibrous glass wool,

coated with a catalytic material and providing a total catalytic surface area which is very large compared to the mass of the substrate elements. The alcohol constituent oxidizes as the molecules contact the catalytic material, and as a result of the oxidation reaction the temperature increases in an amount directly proportional not only to the alcohol concentration but also to the catalytic area/mass ratio. A temperature-sensing device, such as a thermistor, responds to the temperature change and effects the development of an output information signal, the amplitude of which accurately represents the breath alcohol concentration.

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**3,818,900**

**DEVICE FOR SUPERVISING THE HEART AND BREATHING FUNCTIONS OF A PATIENT**

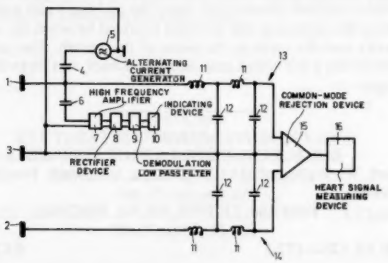
**Bernd Nickel, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munchen, Germany**

**Filed June 23, 1972, Ser. No. 265,944**

**Claims priority, application Germany, June 25, 1971, 2131618**

**Int. Cl. A61b** *5/04*

**U.S. Cl. 128—2.06 R** **4 Claims**




A device for supervising the heart and breathing functions of a patient has a common receiving member constructed as a rheographic electrode for receiving a breathing signal and a first heart signal as well as a further receiving member for receiving a second heart signal. The current feeding generator for the rheographic electrode as well as the device measuring the breathing signals at the rheographic electrode are connected by condensers and by the measuring device for the heart signals with receiving members via low pass filters as well as with a common-mode rejection device. The invention is particularly characterized in that as current feeding generator is used a an alternating current generator with a frequency lying in the kHz range and that for coupling the current feeding generator or the breathing signal measuring device to the rheographic electrode are used condensers having a capacity lying in the pf range.

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**3,818,901**

**APPARATUS FOR AUTOMATICALLY PERIODICALLY MEASURING AND DISPLAYING THE TOTAL AIR EXPIRED BY A SUBJECT DURING EACH OF A SUCCESSION OF GIVEN TIME INTERVALS**

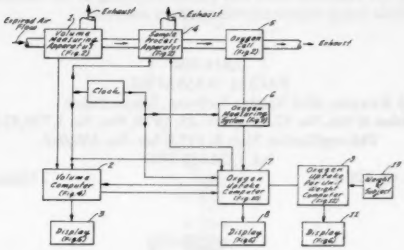
**Clifford Sanctuary, Palos Verdes Estates; Donald C. Woods, Big Bear City, and John A. Bachman, Woodland Hills, all of Calif., assignors to Del Mar Engineering Laboratories, Los Angeles, Calif.**

**Filed Apr. 12, 1972, Ser. No. 243,369**

**Int. Cl. A61b** *5/08*

**U.S. Cl. 128—2.08** **6 Claims**

A respiratory gas analyzer is provided which measures and then instantly displays the volume of expired air from a subject. The instrument includes a positive displacement flow meter which is enclosed in an oven environment and which is used to measure all air expired from the subject, and this volume, computed at body temperature and ambient pressure,



saturated with water vapor (BTPS) is digitally displayed at the end of each minute.

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**3,818,902**

**ENDOSCOPE ASSEMBLY HAVING ITS OPTICAL SYSTEM PROVIDED WITH A DIRECTION SHIFTER**

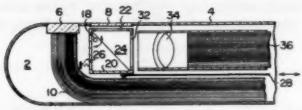
**Kunio Kinoshita, and Mitsuto Itoh, both of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan**

**Filed June 30, 1972, Ser. No. 267,980**

**Claims priority, application Japan, July 3, 1971, 46-49006**

**Int. Cl. A61b** *1/06*

**U.S. Cl. 128—6** **10 Claims**



An endoscope assembly wherein either or both of an illumination optical system associated with an illumination window formed near the outer end of an endoscope and an observation light transmitting optical system associated with an observation window formed near said outer end are equipped with a direction shifter for changing by operation of a control means the direction in which the illumination light is emitted and/or the observation light is received.

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**3,818,903**

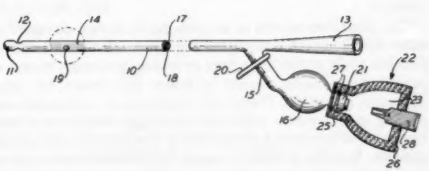
**SELF-INFLATING CATHETER WITH DEFLATING MEANS AND RESERVOIR**

**John A. Bleecker, Summit, N.J., assignor to C. R. Bard Inc., Murray Hill, N.J.**

**Filed Apr. 11, 1973, Ser. No. 350,304**

**Int. Cl. A61m** *25/02*

**U.S. Cl. 128—349 BV** **9 Claims**



An inflatable retention catheter having a resilient, valved, reservoir retaining a fluid under pressure, for automatic infla-

tion of a retention balloon, is provided with an auxiliary reservoir enclosing or attached to the resilient reservoir and having in its wall a valve release device adapted to be manipulated to open the reservoir valve and permit emptying of the balloon, the fluid being received in the auxiliary reservoir.

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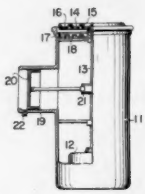
**3,818,904**
**FACIAL MASSAGER**
**Sohji Kawada, 49-6 Nakano 5-chome, Tokyo, Japan**
**Division of Ser. No. 92,687, Nov. 25, 1970, Pat. No. 3,736,921.**
**This application Mar. 8, 1973, Ser. No. 339,046**
**Int. Cl. A61h** *7/00*
**U.S. Cl. 128—56** **2 Claims**




A facial massager wherein at the opening end of a case an elastic friction plate is mounted on the rotary shaft of a motor contained in the case, projected fins are provided on the surface of the friction plate, an inlet hole is bored between the projected fins, a piston in a cylinder provided in projection at right angles to the case is reciprocated by a crank of the rotary shaft, and stains on the face are absorbed by the absorbing action of the piston, massaging the face with the friction plate.

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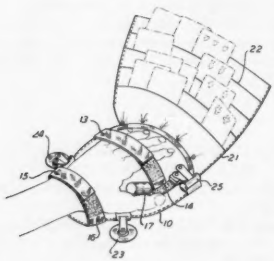
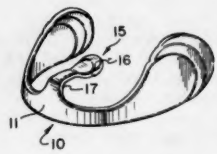
**3,818,905**
**ORTHOPEDIC DEVICE**
**Steve Lebold, 45 Church St., Montclair, N.J. 07042**
**Filed May 11, 1973, Ser. No. 359,233**
**Int. Cl. A61f** *5/10*
**U.S. Cl. 128—77** **2 Claims**




This invention relates to an orthopedic device designed to retain the fingers of a paralyzed hand in a relaxed and normal position while at the same time providing accessory means to permit the paralytic patient to utilize this device for other utilitarian purposes. The device comprises a contoured supporting member over which the palm and fingers of a hand may be positioned and retained in a comfortable and relaxed position. Specific accessory means are provided which can be detachably associated with said supporting member for the purpose of facilitating reading, card playing and similar uses together with easily detached means for firmly attaching said member to a flat surface.

**3,818,906**
**APPARATUS FOR CONTROLLING EATING AND SMOKING HABITS**
**James M. Stubbs, 1111 Lancaster Ln., Rockingham, N.C. 28379**
**Filed Dec. 1, 1972, Ser. No. 311,204**
**Int. Cl. A61f** *5/00*
**U.S. Cl. 128—136** **3 Claims**




Apparatus for reducing the craving for food and tobacco smoke including a flexible resilient member having a central portion received between the lower lip and teeth and a pair of outwardly extending side portions received between the user's cheeks and the teeth at the sides of the mouth. The central portion has a tab which may be flipped back and forth by the tongue.

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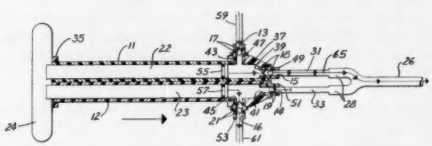
**3,818,907**
**DOUBLE CYLINDER LAVAGE SYRINGE**
**Mark W. Walton, 23433 S. Western Ave., Park Forest, Ill. 60466**
**Filed Apr. 23, 1973, Ser. No. 353,219**
**Int. Cl. A61m** *31/00*
**U.S. Cl. 128—172.2** **6 Claims**




A syringe for stomach lavage is described having dual cylinders and pistons with a common handle for operating the pistons. A check valve system causes discharge from one cylinder for injection purposes and from the other cylinder for discharge purposes when the pistons are moved simultaneously inward, and allows filling of the one cylinder for injection purposes and filling of the other cylinder for discharge purposes when the pistons are simultaneously withdrawn.

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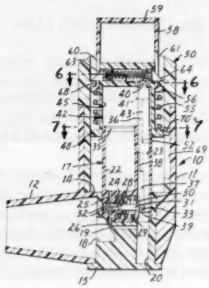
**3,818,908**
**MEDICAMENT DISPENSER**
**Robert E. Phillips, Studio City, Calif., assignor to Riker Laboratories, Inc., Northridge, Calif.**
**Filed Aug. 7, 1972, Ser. No. 278,538**
**Int. Cl. A61m** *11/00*
**U.S. Cl. 128—173** **9 Claims**

A dispenser for dispensing inhalable medicaments which dispenser dispenses the liquid medicaments in a mist by nebulizing a metered amount of the liquid. The liquid is metered by

a rotary piston pump and a piston and cylinder arrangement within the dispenser compresses a small amount of air when a



release mechanism is triggered to carry the dispensed liquid such that the patients will inhale a mist.

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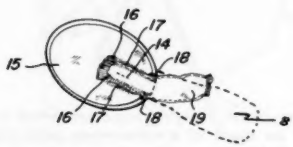
**3,818,909**
**EYE TREATMENT APPLICATION DEVICES**
**Francis H. Bratton, P.O. Box 345, Marion, Va. 24354**
**Filed Oct. 25, 1972, Ser. No. 300,826**
**Int. Cl. A61m** *1/00*
**U.S. Cl. 128—232** **6 Claims**



The present invention provides a convenient sterile system for applying liquids to the eye. The system consists of a plastic container for single application use filled with material soothing or medicinal to the eye. The container with its liquid contents may be attached to a sterile plastic eye cup in an arrangement which allows the eye cup to be used when the user's head is in an upright position.

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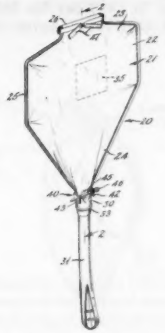
**3,818,910**
**DISPOSABLE SYRINGE**
**Abner G. Harris, 12072 Chestertown, Chester, Va. 23831**
**Filed Oct. 25, 1973, Ser. No. 409,512**
**Int. Cl. A61m** *1/00*
**U.S. Cl. 128—232** **4 Claims**

Apparatus for use in feminine hygiene as a douche and including a disposable bladder having an inlet at one end and a discharge nozzle at the other end. The inlet has flexible structure for maintaining the inlet open when the bladder is being filled and for maintaining the inlet closed and sealed when the contents of the bladder are being discharged. Also, a valve is



disposed at one end of the nozzle to prevent the discharge of fluid until desired.

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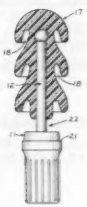
**3,818,911**
**MEDICAMENT AND SWAB TYPE APPLICATORS**
**Erick-Pierre Fournier, 30 Park Ave., New York, N.Y. 10016**
**Filed May 11, 1972, Ser. No. 252,475**
**Int. Cl. A61m** *35/00*
**U.S. Cl. 128—269** **9 Claims**



Applicators for liquid or semi-solid compositions capable of single or multiple use characterized by a unitary handle and elongated stationary or rotatable support for an applicator swab. A cover which protects the swab and can be removed and united with a unitary handle to form an extended handle which may be included as part of the applicator unit.

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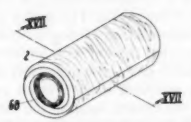
**3,818,912**
**CATAMENIAL TAMPON**
**Herbert Etz, Wuppertal-Langerfeld, Germany, assignor to Dr. Carl Hahn KG, Dusseldorf, Germany**
**. This application Sept. 19, 1969, Ser. No. 870,783**
**Division of Ser. No. 502,780, Oct. 21, 1965, Pat. No. 3,477,102**
**Claims priority, application Netherlands, Oct. 22, 1964, 6412326**
**Int. Cl. A61f** *13/20*
**U.S. Cl. 128—285** **1 Claim**



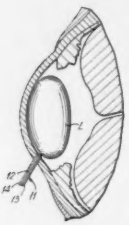
A catamenial tampon having a recess at one end with the draw string wholly disposed within the recess.

3,818,913

## SURGICAL APPARATUS FOR REMOVAL OF TISSUE

Mark Wallach, 220 E. 63rd St., New York, N.Y. 10021

Filed Aug. 30, 1972, Ser. No. 285,002
Int. Cl. A61b *17/32*; A61m *1/00*
U.S. Cl. 128—305 16 Claims



Defective or unwanted tissue is removed such as from the lens of an eye directing a pulsating high velocity liquid jet onto the defecting tissue to disintegrate the tissue and sucking the liquid entraining the disintegrated tissue from the area adjacent the tissue by a suction conduit. Upon clogging of the suction conduit and a corresponding change in pressure, the suction action is momentarily reversed to eject the clogging tissue, which avoids excessive suction build-up. The liquid is advantageously isotonic and slightly alkaline and one or more jets converging to a restricted area may be employed, the jets being ejected from a hand manipulated nozzle.

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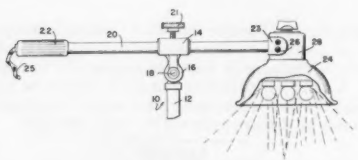
3,818,914

## APPARATUS AND METHOD FOR TREATMENT OF SKIN DISORDERS

Charles E. Bender, New Paltz, N.Y., assignor to Spectroderm Inc., New Paltz, N.Y.

Continuation-in-part of Ser. No. 244,645, April 17, 1972. This application Apr. 3, 1973, Ser. No. 347,499
Int. Cl. A61n *5/06*
U.S. Cl. 128—396 11 Claims



Skin disorders are controlled by irradiation with a mixture of a major portion of ultraviolet light of wave length in the 2537A area with almost to about as much infrared light, and a very small amount of visible light, derived from a filament-controlled 4-watt spheroidal-form mercury vapor lamp for a predetermined period of time.

A preferred apparatus for the use of such lamps includes a plurality of lamps, including a central lamp, surrounded by a bank of similar lamps forming a square configuration. The lamps are disposed in a cylindrical casing in front of a reflective mirror disposed in the casing. The casing is provided with a detachable cover member comprising an annular outer ring forming a central opening therein with an inner annular ring detachably connected to the perimeter of the central opening which inner ring is provided with a small central opening disposed in front of the central lamp in the casing so that the lamp can be used individually or collectively, to cover any desired area from that covered by a single lamp to that covered by the entire bank of lamps, with radiant energy of equal intensity over the area to be covered.

3,818,915

## TOBACCO SUBSTITUTE SMOKING MATERIAL

Robert Craig Anderson, West Kilbride, Scotland, assignor to Imperial Chemical Industries Limited, London, England

Filed Mar. 18, 1971, Ser. No. 125,810
Claims priority, application Great Britain, Mar. 23, 1970, 13865/70
Int. Cl. A24b *15/00*, *15/04*
U.S. Cl. 131—2 5 Claims

Tobacco substitute based smoking mixture with added protein and phenyl acetic acid and/or 2-phenyl ethanol. The protein serves to reduce or eliminate the intensity of the off-odours and off-flavours of the smoke from the substitute smoking material and imparts a tobacco-like flavour and after-taste to the smoke.

The phenyl acetic acid and/or 2-phenyl ethanol serve to mask any off-notes arising from the protein. The tobacco substitute base utilized is preferably a carbohydrate material which has been subjected to a catalytic degradation at a temperature of at least 200° C. to a point at which it constitutes about 90 percent or less of the dry weight of the original carbohydrate.

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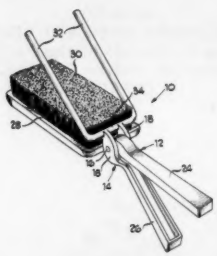
3,818,916

## HAIR MANAGEMENT OR STYLING IMPLEMENT

Burton C. Meyer, Downers Grove, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Filed Feb. 20, 1973, Ser. No. 334,072
Int. Cl. A45d *44/18*
U.S. Cl. 132—85 3 Claims



A hair management or styling implement which is formed generally in the shape of a scissors-type implement, with respect to including a pair of lever-type elongated members pivoted to each other intermediate their ends. Two adjacent ends of the elongated members are in juxtaposition and comprise a pair of handle members for manual grasping and manipulation of the implement in a singular manner by a person's hand in a scissors-type motion. The opposite end of one of the levers has a hair brush, comb, or the like, through which a tuft of hair may pass in a brushing or combing fashion. The bristles or teeth of the brush or comb face inwardly with respect to the implement and a pair of hair guiding arms are formed on the adjacent end of the other elongated lever member for pivotal movement from spaced positions relative to the brush or comb to positions alongside the brush or comb whereby the tuft of hair may be sandwiched between the arms and the brush, or comb, for biasing the hair strands therethrough.

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3,818,917

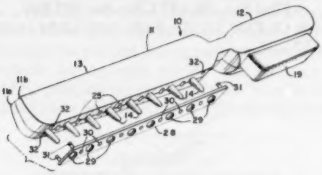
## FROSTING COMB

Alma V. Hudson, 120 Cosco Dr., Alexandria, Va. 22306

Filed Apr. 26, 1973, Ser. No. 354,765
Int. Cl. A45d *24/22*
U.S. Cl. 132—116 11 Claims

A frosting comb for accurately applying controlled amounts of a solution, such as bleach or the like, to hair, said comb

comprising an elongate body with a handle at one end thereof and with teeth at the other end along one side thereof, a collapsible container for said solution in said handle, means on said handle for selectively collapsing said container to



dispense the solution therefrom, normally closed passage means in said body extending from the container in the handle to a reservoir in the body adjacent the teeth, and the passage means extending from the reservoir to dispensing openings adjacent the base of the teeth to dispense the solution onto hair.

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**3,818,918**

**COIN FEED MECHANISM**

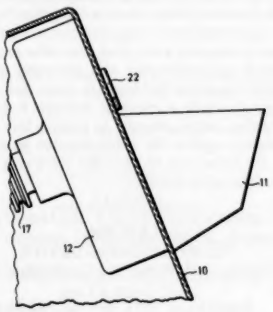
**Jim Arthur Nissmo, and Jan Axel Sundin, both of Staffanstorp, Sweden, assignors to Scan Coin AB, Malmo, Sweden**

**Filed May 30, 1972, Ser. No. 257,818**

**Claims priority, application Sweden, May 28, 1971, 6918/71**

**Int. Cl. G07d** *3/06*

**U.S. Cl. 133—3 H** **4 Claims**



A coin feed mechanism designed to receive a large number of coins and to deliver them one after another comprises a hopper and an inclined rotatable disk arranged in the hopper. Behind the disk there is arranged a rotatable member having a rotational axis which is inclined in relation to the rotational axis of the disk, and this member supports a number of pins. The disk and the member are rotatable together, and during such rotation the member forms a wabble plate for moving the pins between a first position in which the pins project from the disk and a second position in which the pins are withdrawn.

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**3,818,919**

**POCKET UMBRELLA**

**Tilman Schultes, Bechermuhle, 5650 Solingen-Weyer; Werner Keulen, Dultgenstaler Strasse 127, 5650 Soligen-Wald, and Gunter Rottner, Moritz-Hasenclever-Strasse 52, 5652 Burg an der Wupper, all of Germany**

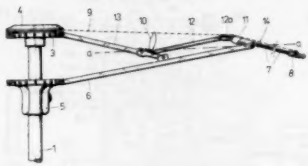
**Filed June 12, 1972, Ser. No. 261,816**

**Claims priority, application Germany, June 12, 1971, 2129265**

**Int. Cl. A45b** *25/14, 25/16*

**U.S. Cl. 135—20 R** **3 Claims**

A pocket umbrella with a runner having linked thereto the inner ends of main stays the outer ends of which are respectively pivotally connected to roof bars the inner ends of which are by means of a connecting bar pivotally connected to a roof stay having one end pivotally connected to the umbrella crown and having its other end pivotally connected to the respective adjacent main stay. Each respective pivotally inter-



connected unit formed by roof and connecting bars and roof and main stays forming an articulated quadrangle and each of the connecting bars having that end thereof which is adjacent to a double hinge pertaining to the respective adjacent roof bar bent in the direction toward the respective adjacent roof bar and linked to the respective adjacent double hinge.

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**3,818,920**

**DEVICE FOR PREVENTING UMBRELLA BAND FROM DANGLING**

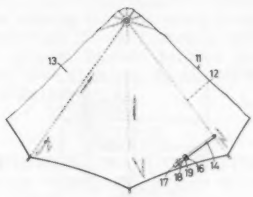
**Shozaburo Oyama, and Keiji Oyama, both of No. 159, 1-chome, Higashi-Toyonaka-cho, Toyonaka-shi, Osaka-fu, Japan**

**Filed Mar. 12, 1973, Ser. No. 340,104**

**Claims priority, application Japan, June 28, 1972, 47-78117; June 28, 1972, 47-78118**

**Int. Cl. A45b** *25/18*

**U.S. Cl. 135—36 F** **5 Claims**



A device for preventing an umbrella band from dangling. The device comprises a resilient band secured to an umbrella cloth at one end thereof, a support piece secured to the umbrella cloth for slidably supporting the other end portion of the band, a hook ring fixed at the other end of the band, and a button engageable with the hook ring when the umbrella is closed. The hook ring serves also as a preventive means against slip-out of the band from the support piece.

The device can also be provided on the inner surface of the umbrella cloth if the umbrella is a collapsible type.

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**3,818,921**

**FLUID FLOW THROTTLING VALVE**

**Joseph L. Peczkowski, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.**

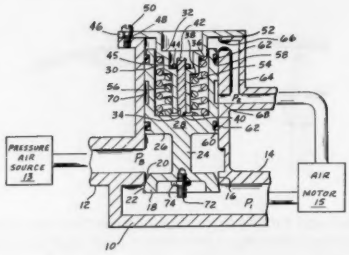
**Filed Sept. 15, 1972, Ser. No. 289,524**

**Int. Cl. F16k** *17/02*

**U.S. Cl. 137—501** **6 Claims**

A fluid pressure responsive poppet type flow throttling valve having a wide range of flow control and provided with relatively large areas exposed to control fluid pressures. The valve is spring loaded by two springs one of which is active in

part range flow control only. The valve is contoured to provide a predetemined valve area vs valve travel to provide gain control and/or a predetermined flow range. In addition to the




above, other structural features including an adjustable stop to control minimum valve flow area serve to minimize undesirable characteristics such as instability, excessive droop and/or reliabliity.

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**3,818,922**

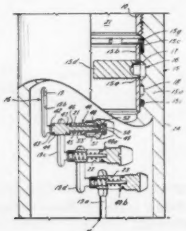
## SAFETY VALVE ARRANGEMENT FOR CONTROLLING COMMUNICATION BETWEEN THE INTERIOR AND EXTERIOR OF A TUBULAR MEMBER

**Billy C. Malone, Houston, Tex., assignor to Lynes Inc., Houston, Tex.**

**Division of Ser. No. 172,447, Aug. 17, 1971, Pat. No. 3,776,308. This application May 21, 1973, Ser. No. 362,586**

**Int. Cl. E21b** *33/12*

**U.S. Cl. 137—70** **4 Claims**



An arrangement for controlling fluid communication between the interior of a tubular member and interior of an inflatable element supported externally on the tubular member including fluid passage means communicating from the interior of the tubular member to the interior of the inflatable element with valve means normally seated to close off flow from the interior of the tubular member to the interior of the inflatable element until a predetermined pressure has been exerted thereon. After the valve has been opened to communicate fluid from the interior of the tubular member to the interior of the inflatable element for inflation thereof, the valve closes when a predetermined relationship is reached between the pressure in the interior of the tubular member and externally of the tubular member. Locking means are provided to lock the valve in closed position and prevent further communication between the interior of the tubular member and interior of the inflatable element when the valve closes.

**3,818,923**

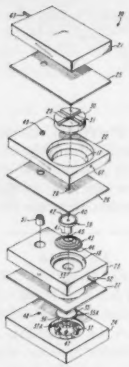
## FLUID CONTROL DEVICE AND METHOD OF MAKING THE SAME

**Louis M. Puster, Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.**

**Filed Nov. 20, 1972, Ser. No. 307,860**

**Int. Cl. F16k** *31/365*; **F15b** *5/00*; **G05d** *16/00*

**U.S. Cl. 137—85** **6 Claims**



A fluid control device having a housing provided with first and second chambers interconnected together by a valve seat. A flexible valve member is disposed in the first chamber for opening and closing the valve seat, the valve member and the housing being so constructed and arranged that the valve member itself has a bias that tends to cause the valve member to close the valve seat. A movable actuator is disposed in the second chamber and is adapted to project through the valve seat and engage against the valve member to urge the same away from the valve seat to open the valve seat in opposition to the bias of the valve member.

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**3,818,924**

## FLUID METERING DEVICE

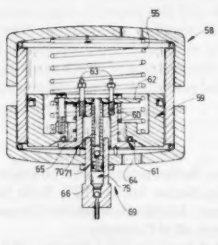
**Lance J. Carlyle, 108 Willia St., Cambridge, New Zealand (04143)**

**Filed Oct. 4, 1972, Ser. No. 294,984**

**Claims priority, application New Zealand, Oct. 5, 1971, 165087**

**Int. Cl. G05d** *11/00*

**U.S. Cl. 137—99** **17 Claims**



A fluid metering device mixes a predetermined quantity of a first fluid with a larger quantity of second fluid supplied to the device at a higher pressure on each cycle. The pressure of the second fluid provides the force necessary to motivate a first pumping means which on movement to an 'outlet' position within a housing displaces the mixed fluids on an outlet side of

the first pumping means to their destination. Movement of the first pumping means actuates a second pumping means which pumps a predetermined quantity of the first fluid into the housing on each cycle. On the maximum pumping stroke of the first pumping means being reached at the 'outlet' position, a passage is opened in the first pumping means which is then restored to an 'inlet' position, the second fluid in the housing passing through the passage during such restoration and thus being available for despatch on the next pumping stroke. When the first pumping means reaches the 'inlet' position the passage closes and a further pumping cycle commences.

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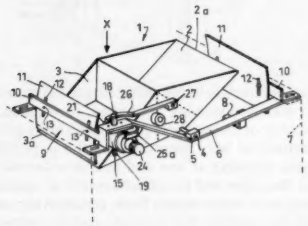
**3,818,925**

## ADDITIVE MEASURING DEVICE

**Magna Oddnar Liset, Queensland, Australia, assignor to Jean Elizabeth Liset, Greenwood, Via Oakey, Queensland, Australia, a part interest**

**Filed Aug. 31, 1972, Ser. No. 285,122**
**Int. Cl. F16k** *19/00*
**U.S. Cl. 137—99.5** **6 Claims**



A dispensing device comprising a pair of buckets symmetrically mounted so as to be movable between emptying and filling positions. Additive metering means operated by the movement of the buckets to supply additive to a trough into which the buckets discharge.

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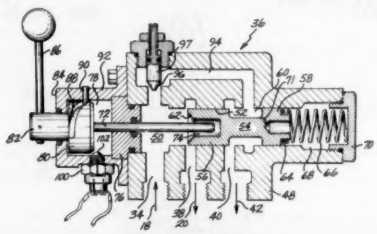
**3,818,926**

## HYDRAULIC VALVE AND SYSTEM

**Donald M. Wohlwend, 16455 S.E. 44th St., Issaquah, Wash. 98027**

**Filed Apr. 11, 1973, Ser. No. 350,179**
**Int. Cl. G05d** *7/01*
**U.S. Cl. 137—101** **17 Claims**



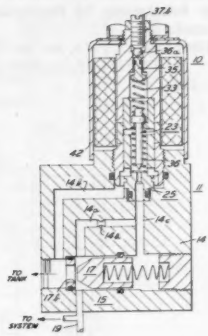
A valve plug is movable between first and second outlets. A two position selector rod is movable to push the valve plug into a first position in which it blocks flow through the second outlet and all flow is through the first outlet. The selector rod is retractable from the valve plug into its second position. When this is done the position of the valve plug is determined by pressure differential and calibrated spring forces acting on it. These forces position the valve plug to divide flow between the two outlets. Flow through the second outlet is maintained substantially constant while excess flow is diverted through the first outlet.

**3,818,927**

## NORMALLY OPEN SOLENOID OPERATED VALVE ASSEMBLY WITH RELIEF FUNCTION

**Kenneth W. Zeuner, Newtown, Pa., assignor to Control Concepts, Inc., Richboro, Pa.**

**Filed June 18, 1973, Ser. No. 370,636**
**Int. Cl. F16k** *31/10*
**U.S. Cl. 137—110** **9 Claims**



A normally open solenoid operated valve assembly having a poppet movable between a valve normally open position and a position for seating in and closing an orifice. A movable armature has a reduced section for engaging the poppet. A range spring tending to bias the poppet to the valve closed position while a bias spring tends to bias the armature to engage and move the poppet to the valve open position. Since the bias spring has a greater spring force than the range spring, the poppet is normally maintained in the valve open position. To close the valve, a solenoid is energized to move the armature in a direction allowing the range spring to bias the poppet closed. When closed, the valve assembly provides a relief function if upstream pressure becomes greater than a predetermined value which may be adjusted by varying the spring force of the range spring.

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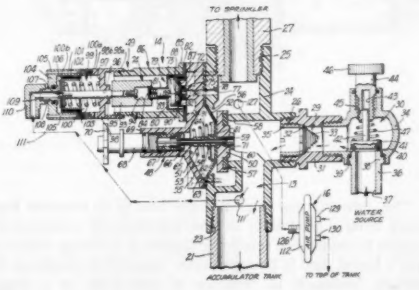
**3,818,928**

## HYDROPNEUMATIC CAPACITOR

**Paul W. Carsten, Malibu, Calif., assignor to CVC Company, Santa Ana, Calif.**

**Filed Feb. 3, 1972, Ser. No. 223,151**
**Int. Cl. B67d** *5/54*; **F16k** *31/12*
**U.S. Cl. 137—211.5** **8 Claims**



A hydropneumatic capacitor particularly useful in sprinkler systems and comprising an air-water accumulator tank connected by conduit means to a low gallonage water source and by a normally closed valve means to a sprinkler head. The

valve means possesses a predetermined pressure threshold of operation for rapidly opening to discharge water from the tank through the sprinkler head. Upon each discharge from the tank, air is pumped into the tank by operatively associated pump means to charge the tank with compressed air.

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3,818,929

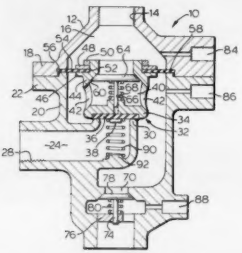
**REDUCED PRESSURE BACKFLOW PREVENTER VALVE**

**Heinz Werner Braukmann, 98 Heathcote Ave., Willowdale, Ontario, Canada**

**Filed Apr. 23, 1973, Ser. No. 353,334**

**Int. Cl. F16k** *45/00;* **E03c** *1/10*

**U.S. Cl. 137—218** **2 Claims**



A backflow preventer valve has a body with a vent chamber, the inner end of which forms a relief valve seat; the base of a cup member, supported on the inner edge of an annular flexible diaphragm with the outer edge secured to the valve body, engages with the relief valve seat to close off the vent chamber. The cup member has an internal check valve seat and contains a check valve biased against the check valve seat.

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3,818,930

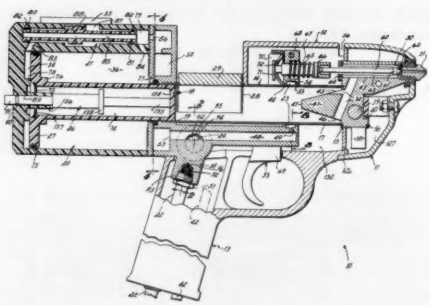
**CONTROL SYSTEM FOR AN ADHESIVE GUN**

**Gerald W. Crum, Elyria; Allan B. Reighard, Bay Village, and Simon Z. Tamny, Lorain, all of Ohio, assignors to Nordson Corporation, Amherst, Ohio**

**Filed Apr. 20, 1973, Ser. No. 352,962**

**Int. Cl. F16k** *49/00*

**U.S. Cl. 137—341** **38 Claims**



The adhesive gun is electrically heated to translate feedstock from a solid state to a molten state, is pneumatically cooled to control the solid/melt feedstock interface within the gun's barrel, and is pneumatically powered to discharge the molten feedstock in response to operation of a trigger mechanism. The control system includes a novel regulator valve, the valve functioning to regulate high pressure inlet air to a maximum, predetermined pressure so that the pneumatic motor is not over powered and a novel pressure switch, the pressure switch functioning as an open/close switch for the heater's electric circuit so that the electric heater cannot function unless the high pressure inlet air is on. A thermostat for the electric heater is also provided in the electric circuit. The regulator valve, pressure switch and the thermostat of the control circuit are all incorporated or located within the adhesive gun's housing.

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3,818,931

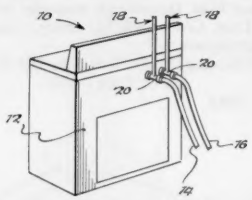
**WATER HAMMER ARRESTER**

**John J. Carpenter, 4054 Lockport Ave., North Tonawanda, N.Y. 14120**

**Filed June 8, 1972, Ser. No. 260,809**

**Int. Cl. F16l** *3/00*

**U.S. Cl. 137—374** **3 Claims**



A water hammer arrester adapted for permanent installation on a water-consuming appliance, such as an automatic clothes washer or dishwasher, comprises a body portion which has a longitudinal bore therethrough and is provided with a female hose coupling at one end and an externally threaded portion at the other end for attachment to an appliance water inlet fitting and a water supply hose, respectively, and an elongated tubular portion that extends radially outwardly from said body portion, said tubular portion having a closed end providing an internal chamber communicating with said bore and adapted to trap air, whereby to provide a shock-absorbing air cushion therein.

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3,818,932

**SAFETY CUT-OFF VALVES FOR GAS SUPPLY SYSTEMS**

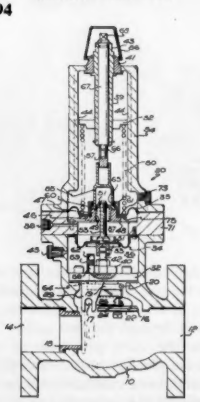
**Ernest Edward Doe, and William Harry Millard, both of Chesterfield, England, assignors to The Bryan Donkin Company Limited, Chesterfield, England**

**Filed Mar. 8, 1973, Ser. No. 339,088**

**Claims priority, application Great Britain, Mar. 13, 1972, 11636/72**

**Int. Cl. F16k** *17/64*

**U.S. Cl. 137—494** **7 Claims**



A safety cut-off valve for a gas supply system a control unit of which is responsive both to a rise above a pre-determined

maximum pressure and to a fall below a pre-determined minimum pressure to cause closure of the valve.

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3,818,933

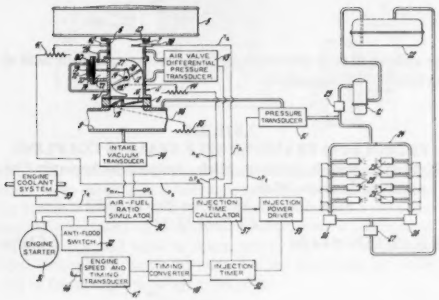
## MASS FLOW AIR METER

William C. Bubniak, 4077 Middlebury Dr., Troy, Mich. 48084; Louis W. Huellmantel, 32886 Haff St., Warren, Mich. 48093, and Harry R. Mitchell, 2907 Whittier Dr., Bloomfield Hills, Mich. 48013

Division of Ser. No. 278,958, Aug. 9, 1972. This application Nov. 19, 1973, Ser. No. 417,297

Int. Cl. F16k *31/365*

U.S. Cl. 137—503 5 Claims




A mass flow air meter for use in a mass air flow type electronic fuel injection system for an engine to measure mass air flow through an air induction system including a scheduled area valve consisting of a butterfly valve cooperating with scheduled valve throat area openings whereby the pressure drop in the induction passage through this valve is held approximately constant during changes in fluid flow by allowing the valve throat area openings to vary.

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3,818,934

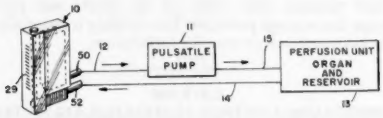
## DAMPENING UNIT FOR PULSATILE PUMP

Alexander S. Borsanyi, Irvine, Calif., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Mar. 9, 1973, Ser. No. 339,605

Int. Cl. A61b *19/00*

U.S. Cl. 137—568 4 Claims




A dampening unit is provided for use in combination with a pulsatile pump, a unit which requires pulsatile flow of fluid, and a unit which requires substantially non-pulsatile flow. The dampening unit comprises a casing having an inner cavity and a pair of spaced-apart, flexible diaphragms attached to the casing within the cavity to provide a chamber between the two diaphragms. As fluid flows through the chamber, the flexible diaphragms expand and contract to dampen the pulsatile flow of the fluid. The dampening unit is connected between the pulsatile pump and the unit which requires substantially non-pulsatile flow.

3,818,935

## PRESSURE VESSEL

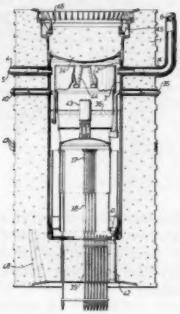
Stig Rutger Karker, Nykoping, Sweden, and Knut Bratland, Slattum, Norway, assignors to Aktiebolag Atomenergi, Stockholm, Sweden

Filed Feb. 9, 1973, Ser. No. 330,945

Claims priority, application Sweden, Feb. 24, 1972, 2312/72

Int. Cl. F16l *11/12*

U.S. Cl. 137—590 11 Claims



The invention relates to a pressure vessel having an external wall, lined internally with a liner, a vessel proper and at least one drain, and more specifically to a new construction of the drain, which e.g. enables the internal vessel to move slightly in relation to the main wall and its liner, in all directions. Should the drain fracture nevertheless, construction prevents any major escape of gas or liquid. This has been accomplished by extending the vessel and the liner in the form of coaxial internal and external tubes respectively, the double tube thus formed comprising first and second straight sections substantially at right angles to each other, or alternatively only comprising a second straight section, and the double tube forming a single tube beyond the second straight section of the internal tube.

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3,818,936

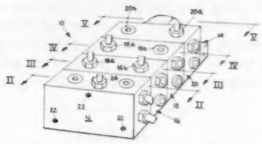
## HYDRAULIC CONTROL VALVE

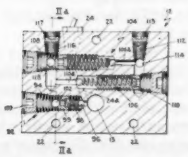
Edward J. Jackoboice; Edward W. Jackoboice, and Gerritt H. Kruizenga, all of Grand Rapids, Mich., assignors to Monarch Road Machinery Company, Grand Rapids, Mich.

Filed June 15, 1972, Ser. No. 262,988

Int. Cl. F15b *11/08*

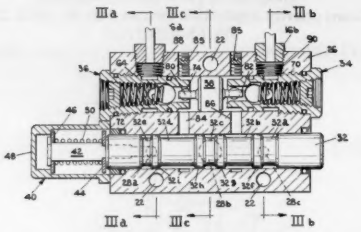
U.S. Cl. 137—596.12 22 Claims





A fluid control valve assembly having a movable primary valve member, preferably a spool valve, for primary control of

inlet fluid under pressure, and at least one secondary valve, preferably a ball-type check valve, which receives the fluid from the primary valve to directly control the operation of connected apparatus such as a power cylinder. The control



valve assembly further includes a movable actuator such as a free piston which receives fluid controlled by the primary valve and is moved thereby to open the check valve even though the latter may then be under fluid pressure normally sufficient to hold it closed.

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**3,818,937**

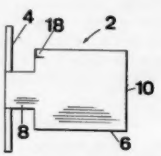
**AIR FLOW CONTROL VALVE**

**Robert D. LaGanke, 243 S. Belvoir Blvd., South Euclid, Ohio 44121**

**Filed Oct. 3, 1972, Ser. No. 294,665**

**Int. Cl. F16k** *11/02*

**U.S. Cl. 137—604** **7 Claims**



An adjustable air flow control valve is provided for a gas burner or other fuel burning apparatus. The valve is located at the end of a pipe in which the fuel is flowing. The pipe has at least one air inlet opening in its side, and the valve has an end plate extending across the end of the pipe and two resilient flanges extending into the pipe. At least one of the flanges is positioned so that it can close the air inlet opening. The flanges fit snugly against the inside wall of the pipe and permit rotation of the valve to various positions in which the air inlet opening is fully closed, partially closed, or open.

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**3,818,938**

**FLUID MIXING APPARATUS**

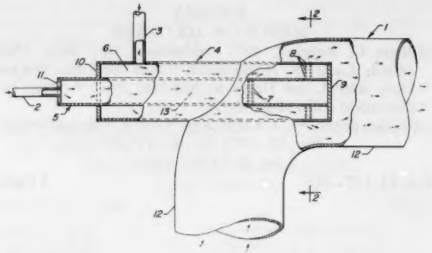
**Don B. Carson, Mount Prospect, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.**

**Filed Oct. 16, 1972, Ser. No. 298,073**

**Int. Cl. F16k** *19/00*

**U.S. Cl. 137—604** **6 Claims**

An apparatus for mixing two fluids and injecting the resulting mixture of the two fluids into a third circulating fluid. The apparatus comprises essentially inner and outer tubes concentrically arranged to form an injection nozzle which itself is placed within a circulating conduit. The inner tube and the outer tube have ports located on their side walls to allow the passage of a fluid through the first tube into the second tube along with fluid passing through the second tube forming a mixture which mixture leaves the outer tube through ports thereon and enters the circulation vessel. The invention can



be utilized in such processes as hydrofluoric or sulfuric acid alkylation of hydrocarbons.

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**3,818,939**

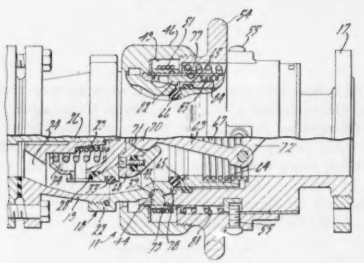
**PETROLEUM TRANSFER SELF-SEALING COUPLING**

**Richard A. Buseth, Jackson, Mich., assignor to Aeroquip Corporation, Jackson, Mich.**

**Filed Aug. 24, 1972, Ser. No. 283,622**

**Int. Cl. F16l** *37/28*

**U.S. Cl. 137—614.06** **5 Claims**



A coupling for fluid lines in which both coupling halves seal in response to pulling apart of the lines. Separation of the coupling halves occurs suddenly rather than gradually upon the attainment of a predetermined separating force. Coupling is accomplished without force being needed by inserting the nipple half into the manifold half and rotating a union ring. An interlock prevents rotation of the ring if pressure is excessive. A high pressure relief valve on the nipple half prevents damage due to surge pressures. The coupling is especially useful in marine petroleum transfer applications.

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**3,818,940**

**PNEUMATIC CONTROL SYSTEM FOR AIR FILTER CLEANING APPARATUS**

**Frans Joris Espeel, Oberuzwil, Switzerland, assignor to Gebrueder Buehler AG, Uzwil, St. Gallen, Switzerland**

**Filed July 17, 1972, Ser. No. 272,194**

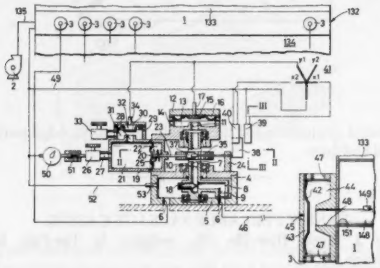
**Claims priority, application Switzerland, July 20, 1971, 10639/71**

**Int. Cl. B01d** *46/04*

**U.S. Cl. 137—624.14** **12 Claims**

Control system for pneumatic control of a cleaning arrangement for dust filters wherein a plurality of tubular filter elements are cleaned by a blast of air forced through the filter elements successively and in the direction reverse to that of filtering air flow. A plurality of quick-opening valves are operatively connected to outlet ports in a housing defining a

pressure chamber. An arm is movably mounted in the chamber and has an air passage therethrough from its inner end to its outer end, the outer end being movable over the outlet ports in succession. The arm is moved intermittently by pneumatically operated means including an actuator movable alternately in opposite directions. The inner end of the air passage communicates with a pneumatically operated control



valve that is disposed in a pneumatic control circuit including other valve mechanisms operated responsive to movement of the actuator in opposite directions to open and close the pneumatically operated valve, to respectively permit a corresponding quick-opening valve to open, and to seal off the chamber from atmosphere during movement of the arm from one outlet port to the next succeeding outlet port.

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**3,818,941**

**VALVE FOR HEATING SYSTEMS**

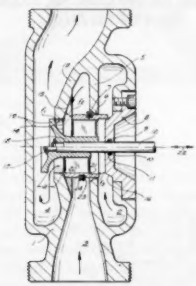
**Edmund Maron, Steinach, Switzerland, assignor to Aktiengesellschaft Adolph Saurer, Arbon, Switzerland**

**Filed May 4, 1972, Ser. No. 250,269**

**Claims priority, application Germany, May 6, 1971, 2122474**

**Int. Cl. F16k** *11/07*

**U.S. Cl. 137—625.4** **9 Claims**



A valve has a first passage which is to communicate with the user, a second passage is to communicate with the source of hot fluid, and a third passage which is to communicate with a return flow conduit from the user to the source of hot fluid. Apertures connect the second and third passages with a chamber to admix hot fluid and cooler return fluid. Another aperture connects said chamber with the first passage. A single valve member is movable by an actuating member between a plurality of positions in which it permits only communication of the second passage with the chamber, of the third passage with the chamber, or of both of the second and third passages with the chamber, and in the latter instance, it varies the proportions of hot and cooler fluid returning from the user which pass from the second and third passages into the chamber as well as the throughput of the admixed fluid to the user.

**3,818,942**

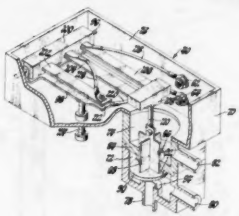
**PURGE CONTROL VALVE AND SYSTEM**

**Jack B. King, Royal Oak, Mich., assignor to General Motors Corporation, Detroit, Mich.**

**Division of Ser. No. 211,991, Dec. 27, 1971, Pat. No. 3,745,984. This application May 10, 1973, Ser. No. 359,014**

**Int. Cl. F16k** *11/02, 31/02*

**U.S. Cl. 137—625.5** **6 Claims**



A purge control valve adapted to control the purge of fuel vapors from storage means into the engine induction system. The valve is preferably connected to the engine starting means and closes in response to an electric current during engine starting to prevent vapors entering the induction system immediately after starting, after which the system is gradually opened to permit normal purge flow. Application of the valve to an engine having crankcase fuel vapor storage is disclosed, although other applications are possible. The valve structure includes electrically heated bimetallic elements, a cutout mechanism to prevent overheating and means for adjusting the valve preload, combined in a single actuating mechanism.

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**3,818,943**

**PNEUMATIC MEMORY RELAY**

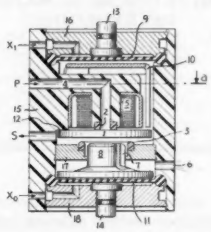
**Daniel Bouteille, 3 Rue Lanen, 92190 Meudon, France**

**Filed Aug. 16, 1972, Ser. No. 281,060**

**Claims priority, application France, Aug. 18, 1971, 71.30746**

**Int. Cl. F16k** *11/02, 31/385;* **G06d** *1/02*

**U.S. Cl. 137—625.66** **23 Claims**



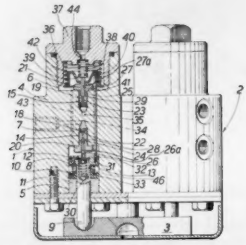
A memory relay has a poppet movable between two positions in a space of the relay housing. The poppet surfaces are arranged to sealingly engage in each position a seat which bounds an input conduit arranged to receive a fluid under pressure.

An output conduit is in communication with both the space and the exterior of the housing. Elements are provided for moving the poppet from one position to the other in response to the application of a set or reset signal to the relay whereby the pressure in one or in the other input conduit is caused to appear at the output conduit. A magnet arrangement is provided for retaining the poppet in at least one position independently of the presence or absence of the pressures in the input conduits.

### 3,818,944
### CONTROL VALVES FOR VEHICLES

**Philip Augustus Taft, Solihull, England, assignor to Girling Limited, Birmingham, England**

**Filed Feb. 25, 1972, Ser. No. 229,319**
**Claims priority, application Great Britain, Mar. 5, 1971, 6146/71; June 25, 1971, 29826/71**
**Int. Cl. B60t** *15/04*
**U.S. Cl. 137—627.5** **11 Claims**

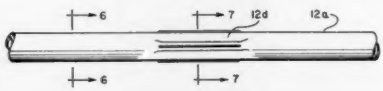


A control valve assembly for an hydraulic braking system comprising a positively actuated piston working in a longitudinal bore in a cylinder body. A first valve controls communication between a first inlet passage in the body and a first chamber defined by the bore, and a second valve controls communication between second inlet passage in the body, and a second chamber defined by the bore and spaced axially from the first chamber. Operation of the first valve is controlled directly by the piston, and operation of the second valve is controlled indirectly by the piston through at least one longitudinally extending push-rod.

### 3,818,945
### FLUID DISPENSING NIPPLE CONSTRUCTION

**Charles W. Bittner, and George F. Rexon, both of Haddonfield, N.J., assignors to Precision Parts Company, Inc., Haddonfield, N.J.**

**Division of Ser. No. 235,748, March 17, 1972. This application May 29, 1973, Ser. No. 364,716**
**Int. Cl. F16l** *55/10*
**U.S. Cl. 138—89** **3 Claims**



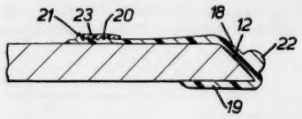

A nipple construction wherein a flexible tube is crimped to define ribs of the tube material interiorly closing the tube.

### 3,818,946
### MEANS FOR PROTECTING AN END OF A TUBULAR MEMBER

**Hedley Allan Bonnes, The Forge, Bredons Norton, near Tewkesbury, and Edward Ravenscroft, Avoncroft, Dock Ln., Bredon, near Tewkesbury, both of England**

**Filed Nov. 8, 1972, Ser. No. 304,786**
**Int. Cl. B65d** *59/00*
**U.S. Cl. 138—96 R** **14 Claims**

An extruded plastics strip for fitment to the end of a pipe to protect said end against damage during transport is of generally U-shape in cross-section including a base and a pair of arms. The strip is particularly intended for use with pipes which have frusto-conical end faces and a portion of the base adjacent one of the arms is of increased thickness to provide




additional protection for the radially innermost edge portion of said end face.

### 3,818,947
### EASILY PEELABLE SAUSAGE CASING

**Henry J. Rose, Danville, Ill., assignor to Tee-Pak, Inc., Chicago, Ill.**

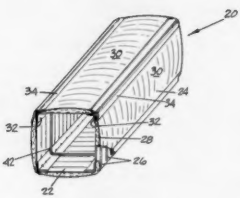
**Filed Jan. 26, 1972, Ser. No. 221,034**
**Int. Cl. A22c** *13/00*
**U.S. Cl. 138—118.1** **8 Claims**

Sausages, such as frankfurters and bolognas, formed in synthetic casings are more easily peeled when the casings are provided with an internal coating of a food grade mineral oil in admixture with an acetylated fatty monoglyceride and about 5 to 30 percent of an alkoxylated type surfactant which is poorly soluble in mineral oil. The coating composition is preferably applied to the interior of the casing as a lubricant during the shirring of the casing on a conventional shirring machine. Other methods of internal coating which are well known in the art may likewise be used for application of the coating solution.

### 3,818,948
### FLEXIBLE AND FOLDABLE CONDUIT

**Lee Minor Hedges, Somerville, N.J., assignor to Johns-Manville Corporation, New York, N.Y.**

**Filed July 18, 1972, Ser. No. 272,820**
**Int. Cl. F16l** *11/12*
**U.S. Cl. 138—119** **3 Claims**

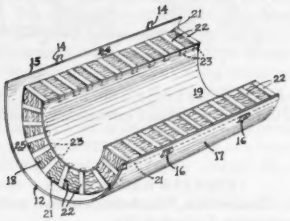



A conduit of polygonal cross section has inner and outer flexible walls which are reinforced by a plurality of elongate stiffening means disposed intermediate the walls in axially spaced-apart planes oriented substantially perpendicular to the longitudinal axis of the conduit whereby the conduit is flexible and can be collapsed in an axial direction. Each of the stiffening means comprises a plurality of elongate stiffening elements which are equal in number to the number of sides of the conduit. These elongate stiffening elements are capable of angular movement relative to other of the elongate stiffening elements in the same plane wherein the conduit can be folded or collapsed until it is essentially flat.

## 3,818,949
## REMOVABLE INSULATED PIPE JACKET

**Lowell Johnson, Chicago, Ill., assignor to Transco Inc., Chicago, Ill.**

**Filed Feb. 5, 1973, Ser. No. 329,594**
**Int. Cl. F16l** *59/14*
**U.S. Cl. 138—158** **3 Claims**

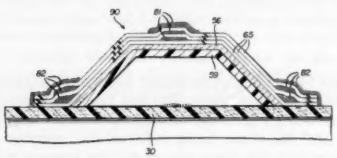


A prefabricated insulated pipe jacket comprising two interlocking semicircular sections, with each section consisting of a stainless steel exterior overlay cover, an inner body of insulation and an interior protective sheet, the overlay cover and interior protective sheet being secured together to either side of the insulation by a series of spaced retaining members carried by a connector strip providing a semi-closure for the insulation while maintaining a minimum heat transfer attachment between the cover and inner protective sheet.

## 3,818,950
## RIB STRUCTURE

**Lee E. Pearson, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio**

**Filed Dec. 29, 1972, Ser. No. 316,592**
**Int. Cl. F16l** *9/12*
**U.S. Cl. 138—174** **9 Claims**



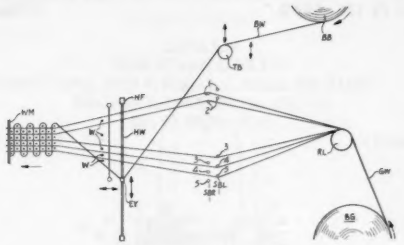
A rib construction for reinforcing fluid retaining walls, particularly walls formed of reinforced synthetic resin. The rib utilizes a pre-fabricated rib form of convex cross-section radially encircling the wall, a plurality of layers of resin impregnated fibrous reinforcement mat superimposed on the rib form by winding and spaced bundles of resin-impregnated radial filament wound roving wound onto the rib form concurrently with the mat layers and specifically placed at the crown and the feet of the mat-covered rib form.

## 3,818,951
## LOOM

**Kurt Greenwood, Dissbury, England, assignor to The Secretary of State for Defence, in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England**

**Division of Ser. No. 92,982, Nov. 27, 1970. This application Sept. 21, 1972, Ser. No. 291,068**
**Int. Cl. D03d** *41/00*
**U.S. Cl. 139—20** **11 Claims**

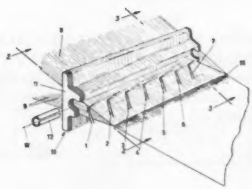
The invention relates to special structures, which may be generally described as three-dimensional fabrics, that is to say fabrics which have substantial measurements in three dimensions as compared with conventional fabrics having substantial measurements in only two dimensions. The structures have special application aa reinforcing, materials in composites such as resin-carbon fibre composites, and consists of ground warps in a matrix of binder warps and wefts, which three sets of components extend in three directions substantially at right angles to each other and lying substantially straight in the body of the structures. The invention also includes a method of producing such structures involving progressing the ground warps longitudinally in three dimensional array and inserting the binder warps and wefts appropriately. The invention also includes a machine for carrying out this method, constructed generally along the lines of a loom, and having the necessary instrumentalities for manipulating the three sets of components in appropriate manner.



## 3,818,952
## JET OPERATED WEAVING MACHINE

**Geert Jan Vermeulen, Beethovenlaan 34, and Josephus Henricus Coolen, Kruisstraat 10, both of Deurne, Netherlands**

**Continuation-in-part of Ser. No. 848,214, Aug. 7, 1969, abandoned, and a continuation of Ser. No. 135,268, April 19, 1971, abandoned, and a continuation of Ser. No. 179,574, Sept. 10, 1971, abandoned. This application Mar. 21, 1973, Ser. No. 343,447**
**Int. Cl. D03d** *47/28*
**U.S. Cl. 139—127 P** **4 Claims**

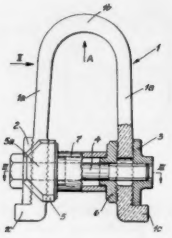


A reed is movable between a beating position and a retracted position, and the warp sheets are maintained momentarily in diverging warp planes to form, with the retracted reed, a shed of generally triangular cross section. Blades movable along with the reed extend between adjacent warp threads and have each a notch which is so shaped that in the retracted position of the reed the upper edge of the notch extends slightly below the upper warp plane and the lower edge of the notch extends slightly above the lower warp plane. A series of hollow fingers are arranged to project between the warp threads into the shed when the reed is retracted. Each finger has near its tip at least one orifice, directed substantially longitudinally of the shed, for discharging a jet to assist in propelling a weft thread through the notches in the blades. The distance between each orifice and the beating edge of the adjacent reed blade is less in the case of orifices more remote from an end of the shed than it is in the case of orifices less remote from such end of the shed.

### 3,818,953
### PICKER STRAP FOR UNDERPICK LOOMS

Max Flukiger, Rapperswil, Switzerland, assignor to Leder & Co. AG, Rapperswil, Switzerland

Filed Nov. 1, 1972, Ser. No. 302,728
Claims priority, application Germany, Jan. 12, 1972, 7200974[U]
Int. Cl. D03d 49/40
U.S. Cl. 139—161 R 2 Claims

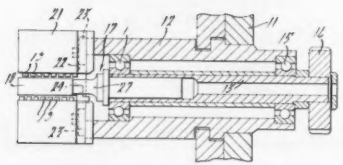


A picker strap assembly comprising a picker strap having shanks traversed by a bolt and disposed between plates, the end of each shank is turned about one of the plates and the inner plates have flanges which flank the respective shank of the picker strap.

### 3,818,954
### WIRE COILING TOOL

Ernst Pfaffle, Neuffen, Germany, assignor to Hans Sickinger Company, Pontiac, Mich.

Continuation-in-part of Ser. No. 248,747, April 28, 1972, abandoned. This application Mar. 8, 1973, Ser. No. 339,408
Int. Cl. B21f 3/02
U.S. Cl. 140—92.3 7 Claims



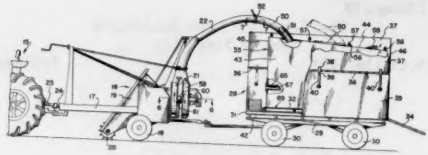
A wire coiling tool having a cylindrical mandrel with inwardly extending guide pins and a wire preforming tool. This tool bends the wire to a smaller radius of curvature than the mandrel, so that the wire will grip the mandrel and be driven thereby.

### 3,818,955
### APPARATUS AND METHOD FOR HARVESTING FORAGE

Joseph M. Kline, 3501 N. Valley St., Arlington, Va. 22207

Filed Aug. 28, 1972, Ser. No. 283,998
Int. Cl. B65b 3/04, 1/04
U.S. Cl. 141—12 3 Claims

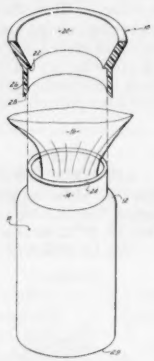
Apparatus for harvesting and treating forage to be used as animal feed in which the forage is placed in flexible airtight containers and is treated to inhibit the growth of mold and fungus. Thereafter liquid and gaseous fluids within the container are evacuated and the container is sealed to preserve the nutritive value of the forage. Prior to sealing, inert gas may be inserted to raise the pressure substantially to atmospheric.



### 3,818,956
### FREEZER BAG HOLDER

Timothy S. Chamberlain, Elizabethtown, Ky., assignor to Day Star Corporation, Lexington, Ky.

Filed Oct. 10, 1972, Ser. No. 296,078
Int. Cl. B65b 39/06
U.S. Cl. 141—316 5 Claims



A holder for holding a thin-walled bag such as a freezer bag in a position for easy filling. The bag holder comprises two pieces, one being a generally tubular, open ended bag support member and the other being a funnel-like member which press-fits around the upper rim of the bag support member. The funnel member includes a chute or funnel surface that leads into the interior of a bag that is clamped between the funnel and support.

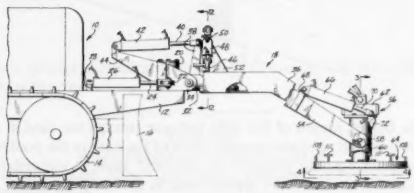
### 3,818,957
### LAND CLEARING AND TREE PLANTING SITE PREPARATION APPARATUS

Richard H. A. Schoonover, Mercer Island, Wash., assignor to Formac International, Inc., Seattle, Wash.

Filed Apr. 20, 1972, Ser. No. 245,972
Int. Cl. A01g 23/02
U.S. Cl. 144—34 R 33 Claims

A brush and tree cutting and pulverizing or comminuting apparatus is mounted on a tracked vehicle. The apparatus includes embodiments for ground preparation for tree planting sites. In general, the apparatus has a cutting head which is mounted for movement on an articulated boom which is in turn mounted on the vehicle. The boom is articulated to manipulate the cutting head for lateral, vertical, pitch and roll movements. The cutter head includes a bearing block having a shaft journaled therein. The shaft is driven by a hydraulic motor. A cutting wheel is affixed to the lower free end of the shaft. Preferably the cutting wheel is a massive disc having a plurality of cutting tooth mounting bars arranged in a

predetermined configuration on its bottom surface and on its periphery. Cutting teeth are movably attached to the mounting bars. The cutting wheel further includes a plurality of cutting teeth, preferably of two different types, affixed to the top surface of the cutting wheel. Other embodiments of the clearing apparatus include multiple wheels mounted generally for rotation in a horizontal plane on a boom. These cutting wheels can feed pulverized, cleared material to a conveyor for windrowing. The conveyor is attached to the side of the vehicle on which the boom is mounted. Other embodiments of the land clearing apparatus can include multiple booms mounted on the vehicle, each of which has a cutting wheel mounted for rotation thereon. In addition, the apparatus can include a cutting wheel mounted for rotation in a generally vertical plane positioned at least in part above a horizontally cutting wheel. This embodiment of the apparatus can include feeder teeth for driving brush downwardly toward the horizontal cutting wheels.



In another embodiment of the invention a site preparation wheel is attached to a movable boom in turn mounted on a vehicle. The site preparation wheel can be a massive disc mounted on a hub in turn mounted on a rotatable shaft on the head of the boom. A plurality of massive ground and rock cutting teeth are arranged in a predetermined pattern and affixed to the bottom portion of the disc. The disc can include an auger means mounted coaxially with the hub to initially break ground for the preparation wheel, to guide the ground and rock cutting teeth into appropriate engagement with the site being prepared, and to excavate a planting hole for a tree. The site preparation wheel can also include a plurality of elongate blades mounted on the wheel or hub. The blades have a ground-engaging elongate cutting surface on the bottom thereof. A shroud can be affixed to the outer portion of these elongate blades to retain dirt or earth removed by the blades at the site rather than spewing the loosened dirt aside.

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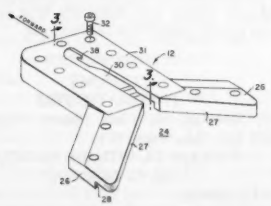
**3,818,958**

**SELF-LOCKING HOLDBACK CLEAT**

**George E. Clarke, Lexington, and Warren E. Krumke, Tall Timbers, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed July 19, 1973, Ser. No. 380,643**
**Int. Cl. B64f** *1/12*
**U.S. Cl. 244—116** **10 Claims**



A self-locking, holdback cleat to restrain an aircraft during high power engine run-ups. The cleat has two pieces—a shoe, attached to the aircraft via a drag-chain, and a deck plate. The shoe has a spool-type button mounted thereon, which drags along the ground as the aircraft moves into position and engages the fixedly mounted deck plate. The deck plate has ramped under-cutting forming a vertical labyrinth which guides the button into locking engagement. When tension is released from the chain, the button may be manually released from the deck plate.

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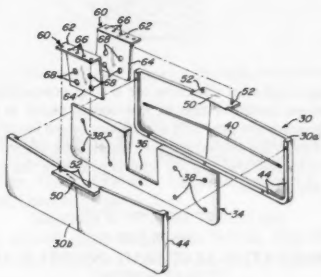
**3,818,959**

**SHIP STABILIZER FIN**

**Everett P. Larsh, 1001 E. Ridge Ln., Miami, Fla. 33157**

**Filed Feb. 9, 1973, Ser. No. 331,333**
**Int. Cl. B63b** *39/06*
**U.S. Cl. 114—126** **4 Claims**



A light-weight, strong, low cost fin for ship stabilization. The fin is composed of plastics materials, such as polystyrene, polyurethane, and the like. The fin is strong and durable in its use as a ship stabilizer. However, the type of materials used in the fin permit the fin to be readily crushed or broken upon impact with other objects, to prevent transmission of forces to the ship which might damage the ship which is stabilized by the fin.

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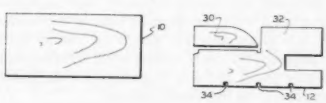
**3,818,960**

**MANUFACTURE OF DOOR JAMB AND DOOR STOP SIMULTANEOUSLY FROM SAME WOOD MEMBER**

**Arthur A. Pozzi, Portland, Oreg., assignor to Bend Millwork Company, Bend, Oreg.**

**Filed Oct. 10, 1972, Ser. No. 296,249**
**Int. Cl. B27c** *9/00*
**U.S. Cl. 144—326 R** **7 Claims**



A method and apparatus for simultaneously manufacturing a door jamb and door stop from the same wood member are described in which the stop is completely formed before it is separated from such wood member. Some surfaces of the stop and jamb are shaped simultaneously by the same cutter. As a result, the stop is easier to manufacture, because it is shaped while it is still attached to a thicker board so that it is easier to hold during cutting, requires less precision cutting and is not broken as often. This also enables the board to be fed through the shaper apparatus at a faster rate.

3,818,961

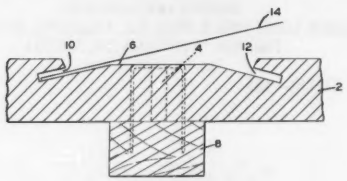
## JOINT CONSTRUCTION FOR CEILING PANELS

John R. Davey, Camp Hill; Charles F. Gilbo, Lancaster; Norman A. Johnson, Lititz, and Thomas W. Fritz, East Petersburg, all of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Continuation of Ser. No. 153,508, June 16, 1971, Pat. No. 3,745,734. This application Dec. 15, 1972, Ser. No. 315,524

Int. Cl. B27c 9/00

U.S. Cl. 144—326 R 2 Claims




An improved joint structure for a strip concealing means which covers fasteners that hold a ceiling panel in position. Angled grooves are provided in a ceiling board for receiving a strip. Between the angled grooves, staples are placed to fasten the board in position, and the strip is placed in the grooves to conceal the staples.

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3,818,962

## COMBINATION BEACH BAG AND INFLATABLE MATTRESS

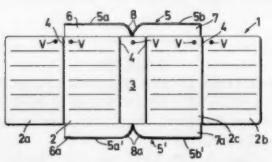
Wolf Georg Muller-Scherak, Vincenz-Statz, Str. 8, Cologne, Germany

Filed May 16, 1972, Ser. No. 253,740

Claims priority, application Germany, Aug. 9, 1971, 7130478

Int. Cl. A45c 9/00

U.S. Cl. 150—1 10 Claims




A convertible device which may be formed into either a carrying bag or mattress comprises a plurality of panels extending from each side of a relatively narrow center panel, the panels being inflatable and hinged together. Side flaps having closure devices extend from the opposite ends of the center panel and at least one of the adjacent panels for joining the ends of the panels adjacent the center panel when forming a carrying bag. The center panel and side flaps provide increased width for the bag permitting increased capacity.

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3,818,963

## MAILING BAG

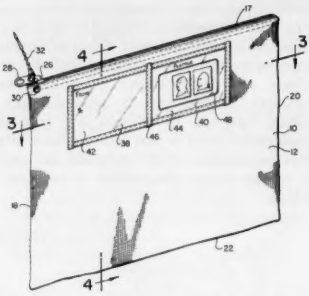
Harlan M. Whitman, Edina, Minn., assignor to United States Envelope Company, Springfield, Mass.

Filed June 12, 1972, Ser. No. 261,624

Int. Cl. A45c 13/42

U.S. Cl. 150—15 7 Claims

A bag for containing a number of smaller items throughout the course of a mailing or other transit is made from two overlying panels of flexible sheet material which are joined to one another to form a main pocket having a mouth closed by a slide fastener. A transparent patch is attached to one of the panels of the bag to provide a smaller pocket for a postage and address card. The card pocket is so designed that closing of the bag by means of the slide fastener entraps the card in the card pocket, and also so that a part of the card in the pocket is exposed for the purpose of allowing stamps, cancellation marks or the like to be applied directly to the card.

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3,818,964

## TREAD PROFILE OF A RADIAL TIRE FOR MOTOR VEHICLES

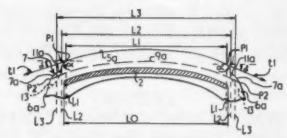
Luigi Maiocchi, Milan, Italy, assignor to Industrie Pirelli S.p.A., Milan, Italy

Filed Nov. 9, 1972, Ser. No. 304,984

Claims priority, application Italy, Nov. 12, 1971, 31004/71

Int. Cl. B60c 9/18

U.S. Cl. 152—209 R 6 Claims




A radial pneumatic tire having a tread disposed on a carcass between its sidewalls and having an annular reinforcing member or breaker embedded between the tread and carcass is provided with a shoulder between the tread and each sidewall having a conical surface to facilitate steering a vehicle equipped with radial tires from one lane to a second lane which is on a level higher than the first one.

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3,818,965

## PNEUMATIC TIRE

James F. Newman, St. Clair Shores, Mich., assignor to Uniroyal Inc., New York, N.Y.

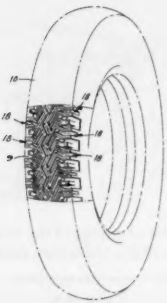
Filed Apr. 24, 1972, Ser. No. 247,112

Int. Cl. B60c 11/07

U.S. Cl. 152—209 R 4 Claims

A pneumatic tire having slots within the sub-tread for cooling purposes. The slots are generally placed in the shoulder regions of the tire, since these regions are materially thick and consequently retain more heat during tire operation. The slots

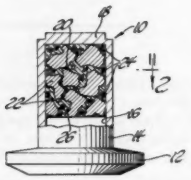
divide the thick heat absorbing rubber regions into smaller regions of lesser heat absorption. Also, the walls of the slots provide a greater surface area to blend-off excess heat from the base of the tread.



### 3,818,966
### HIGH DENSITY CARBIDE STUD

**Charles S. Baum, Saint Clair, Mich., assignor to Textron, Inc., Detroit, Mich.**

**Filed June 5, 1972, Ser. No. 259,887**
**Int. Cl. B60c** *11/00*
**U.S. Cl. 152—210** **9 Claims**



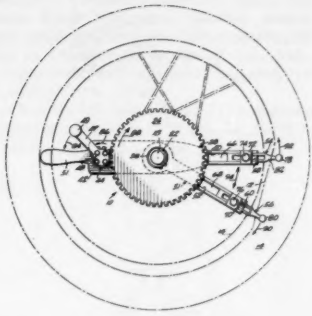
A tire stud is formed by filling a tubular rivet, from its open end, with tungsten carbide grit of a relatively large particle size. After tamping and vibratory compacting of this grit the voids between the grit particles are filled with carbide grit of a substantially smaller particle size by vibratory techniques. The skeleton thus formed is filled with a molten matrixing metal and then cooled. The stud exhibits wear properties which approximate those of a rubber tire in which it embedded so that the end of the stud projects slightly beyond the tread surface of the tire during the life of the unit.

### 3,818,967
### TIRE REMOVAL AND MOUNTING TOOL

**John Karl Dunn, P.O. Box 1593, Sebring, Fla. 33870**

**Filed Nov. 9, 1972, Ser. No. 304,918**
**Int. Cl. B60c** *25/06, 25/04*
**U.S. Cl. 157—1.22** **5 Claims**

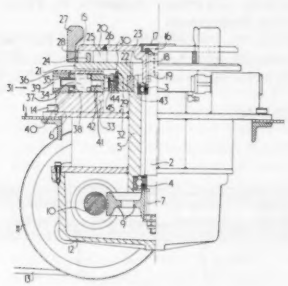
A tire removal and mounting tool that is particularly adapted for use in removing tires from rims that have no lug holes such as those used on motorcycles. The tool comprises a crank lever fixed to a pinion gear in mesh with a large gear and a pair of arms, driven respectively thereby, each carrying a removable, adjustable tool at its outer end portion for engagement under the bead of a tire to be removed from a rim. Actuation of the crank handle normally moves the arms relative to each other, one clockwisely and the other counter clockwisely, to lift the tire bead out of engagement from within the periphery of the rim or to engage the bead thereunder. The tool is rotatably mounted on any type of spindle, such as the wheel axle, inserted through the center hole in the wheel.



### 3,818,968
### APPARATUS FOR USE IN MOUNTING TIRES ON AND REMOVING TIRES FROM WHEEL RIMS

**Derek Hogg, Sutton Coldfield, England, assignor to Dunlop Limited, London, England**

**Filed May 8, 1972, Ser. No. 251,083**
**Claims priority, application Great Britain, May 12, 1971, 14606/71**
**Int. Cl. B25c** *25/06*
**U.S. Cl. 157—1.24** **5 Claims**



An apparatus for mounting and removing tires from wheel rims having at least three arms with means to engage the wheel rim for holding it. Each of the arms has one end pivotally secured to a circular plate and the center portion of each arm is slidably and pivotally mounted to another circular plate so that the free ends of the arms are radially movable when one plate is rotated in relation to the other. Braking means continuously engage one of the plates to insure relative rotation between the plates. The braking means move in a radial direction so that the braking surfaces will be self-cleaning.

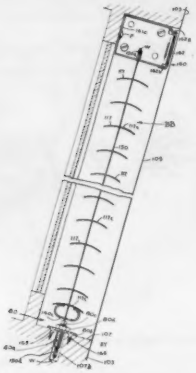
### 3,818,969
### INCLINED-PLANE VENETIAN-BLIND INSTALLATION

**Victor Debs, Staten Island, N.Y., assignor to Levolor Lorentzen, Inc., Hoboken, N.J.**

**Continuation-in-part of Ser. No. 829,069, May 29, 1969, Pat. No. 3,721,285. This application Nov. 22, 1971, Ser. No. 201,040**
**Int. Cl. E06b** *9/305*
**U.S. Cl. 160—168** **10 Claims**

A building wall inclines to the vertical and has a window opening therein which is provided with a Venetian blind. The

general plane of the window opening inclines similarly to the inclination of the wall, and the plane of the ladder-and-slat assembly of the blind is inclined to correspond with the inclination of the window opening.



## 3,818,970
## WEIGHTING BAND FOR CURTAINS, DRAPES, OR THE LIKE AS WELL AS FOR ITS MANUFACTURE

**Rudolf Schmitz, Kastanienbaum, Switzerland, and Franz Baier, Saerbeck, Germany, assignors to Firma Gardisette GmbH, Zug, Switzerland**

**Division of Ser. No. 782,402, Dec. 9, 1968, Pat. No. 3,684,608. This application June 2, 1972, Ser. No. 259,226**
**Claims priority, application Germany, Dec. 12, 1967, 51869**
**Int. Cl. A47h** *1/00*
**U.S. Cl. 160—349** **13 Claims**

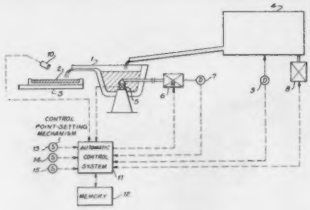
An apparatus for producing a weighting band for curtains, drapes and the like and the weighting bands produced thereby, in which the lead bodies are arranged at a predetermined spacing within an envelope surrounding the same and in which the lead bodies are retained in the predetermined spacing without the need of a core.

## 3,818,971
## METHOD FOR CASTING BLOCKS

**Erich Schutz, Treburerstrasse 42, 6064 Bischofsheim, Germany**

**Continuation-in-part of Ser. Nos. 147,646, May 27, 1971, abandoned, and Ser. No. 781,484, Dec. 5, 1968, abandoned. This application Apr. 14, 1972, Ser. No. 244,139**
**Int. Cl. B22d** *5/02, 1/02*
**U.S. Cl. 164—4** **8 Claims**

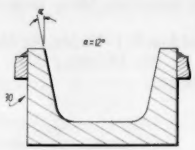
A tiltable furnace to supply molten metal to a ladle and the ladle is connected to a computing and automatic control system which continuously senses the rate of change of weight of the ladle as liquid is poured from the ladle into a mold. The control system tilts the furnace and the ladle to regulate the flow of liquid into the mold to hold the casting to a predetermined weight. The rate of change of the weight of liquid times the time of the pour will give the weight poured in that time.




## 3,818,972
## CAST BAR DRAFT ANGLE

**Milton E. Berry, Carrollton, Ga., assignor to Southwire Company, Carrollton, Ga.**

**Filed Oct. 5, 1972, Ser. No. 295,360**
**Int. Cl. B22d** *11/06*
**U.S. Cl. 164—87** **14 Claims**




This disclosure relates to improvements in the casting groove on the periphery of an open casting wheel. The groove is formed with a draft angle in the range of 11-½° to 14-½° which results in an average increase in casting wheel life of more than 50 percent over prior art casting wheels.

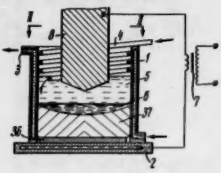
## 3,818,973
## ELECTROSLAG REMELTING APPARATUS

**Boris Evgenievich Paton, ulitsa Kotsjubinskogo, 5, kv. 21; Boris Izrailevich Theddvar, bulvar Lesi Ukrainki, 2, kv. 8; Jury Vadimovich Latash, Vozdukhoflotsky prospekt. 81, kv. 14; Leonty Vasilievich Chekotilo, ulitsa Scherbekovka, 49a, kv. 10; July Georgievich Emelyanenko, ulitsa Darvina, 5, kv. 5; Vasily Ivandvich Us, ulitsa Saxaganskogo, 58, kv. 12; Vitaly Mikhailovich Baglai, ulitsa Semashko, 10, kv. 54/3; Viktor Mikhailovich Martyn, ulitsa Vernadskogo, 65, kv. 102; Viktor Leonidovich Artamonov, ulitsa Sovskaya, 9, kv. 4; Oleg Petrovich Bondarenko, ulitsa Kreschatik, 15, kv. 34; Georgy Alexandrovich Boiko, ulitsa vl. Libedskaya, 16, kv. 106; Anatoly Konstantinovich Tsikulenko, ulitsa Babushkina, 23, kv. 38; Vasily Vladimirovich Ivon, Darnitskoe shosse, 107/2, kv. 16, and Leonid Viktorovich Pavlov, Borschagovskaya ulitsa, 234, kv. 6, all of Kiev, U.S.S.R.**

**Division of Ser. No. 125,744, March 18, 1971, Pat. No. 3,776,294. This application Mar. 8, 1973, Ser. No. 339,067**
**Int. Cl. B22d** *27/02*
**U.S. Cl. 164—252** **2 Claims**

A method of electroslag remelting of consumable electrodes, characterized in that the agents improving the quality of the ingot are blown into the melt so that the injected flows of these agents cause rotation of this melt. A mould for electroslag remelting of consumable electrodes in the process of simultaneously blowing agents to the melt which improve the quality of the ingot, the mould being provided with at least one nozzle for blowing said agents into the melt, in which case the

longitudinal axis of the nozzle is inclined to the walls of the mould under an angle other than a right angle. A consumable electrode provided with a nozzle for blowing agents into the



melt to improve the quality of the ingot, which nozzle is made is the form of a coil wound on the electrode and made of the material being melted.

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**3,818,974**

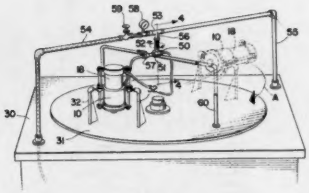
**CENTRIFUGAL VACUUM CASTING APPARATUS**

**Otto Eugen Eberle, 421 Guildwood Pky. W., Hill (Toronto) Ontario, Canada**

**Continuation-in-part of Ser. No. 157,269, June 28, 1971, Pat. No. 3,731,726. This application Dec. 7, 1972, Ser. No. 312,863**

**Int. Cl. B22d** *13/06, 25/02*

**U.S. Cl. 164—255** **6 Claims**



In combination with a centrifugal casting machine of the type described, suction cover means shaped and adapted to be fitted over the free end of the flask or cylinder containing the investment, sealing means for sealing the same to prevent entry of air between said suction cover and said flask, attachment means securing the suction cover in position and maintaining the same in position during operation of the centrifugal casting machine, and being releasable and removable therefrom subsequent to casting, flexible air hose means connectable to said suction cover, and permitting the same to swing between the vertical and horizontal position of said investment flask, fixed air conduit means positioned adjacent to said casting machine, and rotatable coupling means connecting said flexible air hose means to said fixed air conduit means, said rotatable coupling being oriented and located in alignment with the axis of rotation of said centrifugal casting machine, whereby a vacuum may be applied to the closed end of the said investment flash during operation of said centrifugal casing machine; and a method of casting precious metals by centrifugal casting including the steps of applying a vacuum to one end of the investment flask during the rotation of the investment flask and heating cylinder.

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**ERRATUM**

For Class 164—300 see:
Patent No. 3,818,985

**3,818,975**

**METHOD OF REMOVING CARBONACEOUS MATTER FROM HEAT EXCHANGE TUBES**

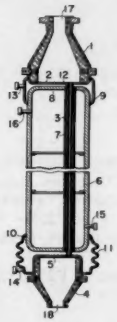
**Ichiro Tokumitsu; Toshisada Takemura; Minoru Sugiyama, all of Tokyo; Kenji Nishiyama, Sokashi; Shigeo Ogawa, Chibaken, and Sadao Okijama, Tokorozawashi, all of Japan, assignors to Idemitsu Petrochemical Co., Ltd., both of Tokyo, Japan and Ishikawajima-Harima Jukogyo Kabushiki Kaisha, both of Tokyo, Japan**

**Division of Ser. No. 162,048, July 13, 1971, abandoned. This application May 23, 1973, Ser. No. 362,975**

**Claims priority, application Japan, July 21, 1970, 45-63218**

**Int. Cl. F28d** *7/10*

**U.S. Cl. 165—1** **4 Claims**



In a heat exchanger having a tube bundle comprising a plurality of inner tubes and a plurality of cooling tubes, each of the inner tubes being arranged within each of the cooling tubes and passed therethrough to provide a double tube structure. The inside of the inner cooling tubes are gas tightly connected to both inlet and outlet chambers for high temperature fluid and the outside of the inner cooling tubes are gas-tightly connected to both inlet and outlet compartments for heat transfer medium as open ends, a high pressure lower temperature fluid is passed through the outside of the outer cooling tubes, a fluid having a high thermal conductivity, for example, molten lead, lead alloy, tin, tin alloy bismuth, sodium, salts of mercury or of sodium in a molten state, is passed through the outside of the inner cooling tubes as the heat transfer medium in ordinary case, and a gas having a low thermal conductivity is passed therethrough as a heat transfer medium when the inner tubes are required to be maintained at a high temperature.

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**3,818,976**

**PROCESS AND APPARATUS FOR GRINDING GRANULAR MATERIALS AT LOW TEMPERATURES**

**Anton Ledergerber, Domatems, Switzerland, assignor to Inventa AG fur Forschung und Patentverwertung, Zurich, Switzerland**

**Filed Nov. 30, 1970, Ser. No. 93,824**

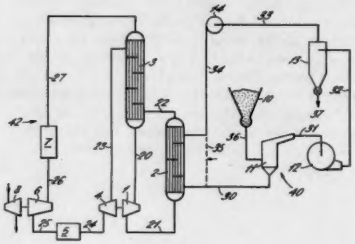
**Claims priority, application Switzerland, Dec. 1, 1969, 17885/69**

**Int. Cl. F25b** *29/00*

**U.S. Cl. 165—1** **5 Claims**

Method and apparatus for the grinding of granular materials is provided in which the granular material is kept cool during the grinding operation. A stream of cool gas is mixed with the granular material in the grinding mill and recycled to a heat exchanger in which its heat is given up to a cool gas being continuously recycled through the heat exchanger. Compression

and isentropic expansion means are provided in conjunction with the cooling gas to control the temperature of the cooling



gas and thereby the temperature of the gas which is mixed with the granular material.

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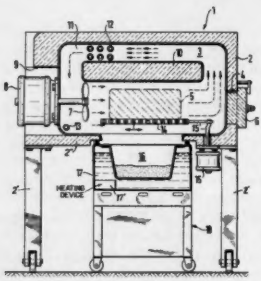
**3,818,977**
**THAWING FROZEN FOOD**

**Alfred Lohr, Bochum, Germany, assignor to F. Kuppersbusch & Sohme Aktiengesellschaft, Gelsenkirchen, Germany**

**Filed Mar. 30, 1972, Ser. No. 239,599**
**Claims priority, application Germany, Mar. 30, 1971, 2115340**
**Int. Cl. F25b *13/00***
**U.S. Cl. 165—2** **1 Claim**



A method and apparatus for thawing blocks of frozen food by vibrating them on a grate within a thawing chamber while they are thawed by circulating hot air. The vibrations cause pieces to be ejected from a block after the required amount of heat has been supplied to melt these pieces. The ejected pieces are received in a collecting vessel which is maintained at a predetermined temperature to bring these pieces to serving temperature.

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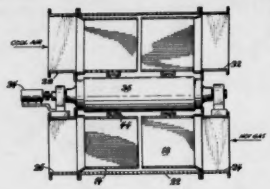
**3,818,978**
**INTER-LOCKING ROTOR ASSEMBLY**

**Harlan E. Finnemore, Wellsville, N.Y., assignor to The Air Preheater Company, Wellsville, N.Y.**

**Filed Nov. 13, 1972, Ser. No. 306,261**
**Int. Cl. F28d *19/00***
**U.S. Cl. 165—9** **2 Claims**

A basket for a rotary regenerative heat exchanger in which the several baskets thereof are pivotally supported outward from a central rotor post. The baskets have walls that overlap the walls of a basket adjacent thereto to preclude the leakage of fluid between the pivotally held baskets. The separate baskets cooperate with one another to produce a composite



unit that is structurally strong while it permits a limited amount of independent movement of the separate baskets.

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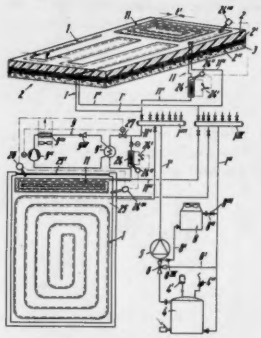
**3,818,979**
**HEAT EXCHANGE SYSTEM**

**Hans Hilgemann, Recklinghausen, Germany, assignor to Tour Agenturer AB, Johanneshov, Sweden**

**Filed Nov. 28, 1972, Ser. No. 310,083**
**Claims priority, application Germany, Dec. 9, 1971, 2161119**
**Int. Cl. F24f *3/14***
**U.S. Cl. 165—21** **12 Claims**



Two or more separate conduit units are provided, which can be embedded at remote positions in structural elements. Each conduit unit has an inlet portion, an outlet portion and a main body portion communicating with these and including at least two parallel sections of identical internal cross-sectional area arranged in heat-exchanging contact with one another over substantially their entire length. Heat exchange fluid can be circulated through the conduit units individually and can be controlled individually as to its temperature level.

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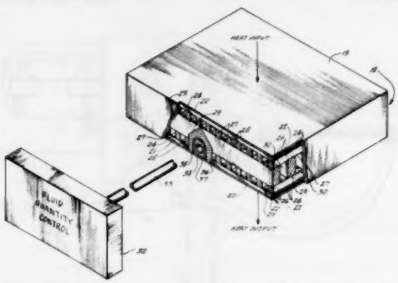
**3,818,980**
**HEATRONIC VALVES**

**Robert David Moore, Jr., 817 W. Camino Rd., Arcadia, Calif. 91006**

**Filed June 11, 1971, Ser. No. 152,093**
**Int. Cl. F28d *15/00***
**U.S. Cl. 165—32** **42 Claims**

Greatly improved heat valves, here termed heatronic valves, that are thermal analogs of NPN and PNP transistors are described individually and in analogs of electronic circuits. The heatronic valves comprise closed chambers including capillary material and a heat transfer fluid for conducting a large heat flow across a small temperature gradient in a first state and for resisting substantial heat flow across a substantial temperature gradient in a second state. They include multiply

vented heat transfer surface structures at the heat input and heat output faces of the chamber which allow very high heat flux densities. Means are provided for changing between the first and second states in response to temperature or pressure inputs by adding or subtracting heat transfer fluid, or a second fluid, from the heat transfer portion of the chamber. The energy necessary for operating the heatronic valves is generally derived from the available temperature differential, thus requiring no external power sources. A thermal "capacitor" is also provided and circuits for diodes, constant temperature sources and several types of amplifiers are shown, as is a general technique for converting almost any electronic circuit to its thermal analog or heatronic circuit.



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**3,818,981**

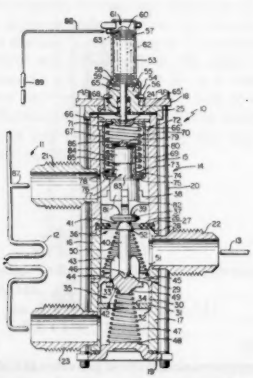
**VALVE CONSTRUCTION AND SYSTEM UTILIZING THE SAME**

**Edward N. Caldwell, Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.**

**Filed Sept. 20, 1972, Ser. No. 290,558**

**Int. Cl. G05d *23/13***

**U.S. Cl. 165—35** **20 Claims**



A three-way changeover valve construction having a housing means provided with an inlet and a pair of outlets. A pair of valve seats are carried by the housing for respectively controlling fluid flow from the inlet through the outlets. A pair of valve members are provided for respectively controlling the valve seats with the valve members being operatively associated together to move substantially in unison relative to the valve seats in response to a condition sensed by a condition responsive device. A change-over device is operatively associated with the valve members to position the same to act respectively on one side of the pair of valve seats or on the other side of the pair of valve seats to change the valve construction from a cooling function thereof to a heating function thereof in response to a temperature change in the flowing medium.

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**3,818,982**

**DEVICE FOR COOLING WORKPIECES WHICH ARE SUBMITTED TO A VACUUM TREATMENT**

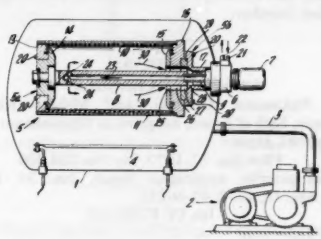
**Rudolf Wagner, Buchs, Saint Gall, Switzerland, assignor to Balzers Patent-Und Beteiligungs-Aktiengesellschaft, Balzers, Furstentum, Liechtenstein**

**Filed Oct. 24, 1972, Ser. No. 300,373**

**Claims priority, application Switzerland, Oct. 27, 1971, 015692/71**

**Int. Cl. F28d *11/02***

**U.S. Cl. 165—86** **5 Claims**



A cylindrical jacket of rubber-like elastic material is mounted on a rotary drum forming part of the equipment of a chamber for vacuum coating, and it is hermetically sealed with each end of the drum so that the drum interior is separated from a surrounding evacuated space of a treatment chamber. The workpieces to be coated are supported on the periphery of the cooling jacket which is stretched against the bottom surfaces of the workpieces so as to create a heat conduction contact. The jacket is cooled by coolant which is circulated from outside the vacuum chamber through the drum shaft and around the inner jacket surfaces and out through an annular conduit surrounding the drum shaft. The coolant flow causes a pressure difference between the drum interior and the chamber surrounding the drum so that the inflating cooling jacket applies tightly against and, because of the suppleness of the material, conforms exactly to the shape of the workpiece surfaces. The workpieces may be supported exteriorly by a cylindrical cage or grid which encompasses the cooling jacket and, at the same time, forms a limiting means for the inflation of the jacket.

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**3,818,983**

**COOLED ENCLOSURE**

**William M. Grandia, York, Pa., assignor to Borg-Warner Corporation, Chicago, Ill.**

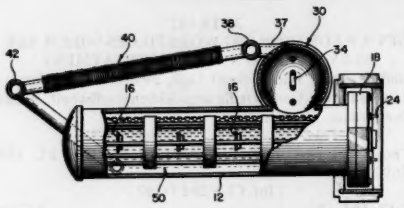
**Filed Sept. 18, 1972, Ser. No. 290,028**

**Int. Cl. F28d *15/00*; H01l *1/12***

**U.S. Cl. 165—105** **1 Claim**

A cooled enclosure for housing heat generating devices, particularly solid state elements such as SCRs, diodes and other components, including a first chamber in which the heat generating devices are immersed in a refrigerant which will vaporize and abstract heat from the devices. The refrigerant vapor is condensed in a second chamber in which a heat exchanger is disposed, said heat exchanger being supplied with a liquid coolant. The condensed refrigerant then returns to the first chamber and is added to the body of liquid refrigerant in said chamber. An important feature of the invention is an alternate, secondary flow path for the refrigerant vapor through a secondary heat exchanger which is preferably air cooled. Under conditions when the ambient air is effective

to condense refrigerant without operation of the primary liquid cooled heat exchanger, the vapor is condensed in such




secondary heat exchanger and returned to the refrigerant bath in the first chamber.

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**3,818,984**

## HEAT EXCHANGER

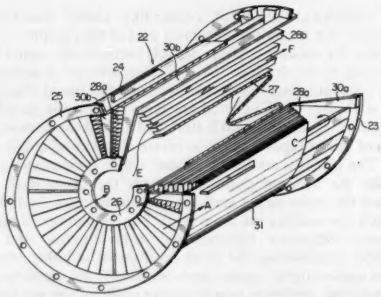
**Kenya Nakamura, Okazaki, and Makoto Kuroyanagi, Hekinan, both of Japan, assignors to Nippondenso Co., Ltd., Kariya-shi, Japan**

**Filed Jan. 17, 1973, Ser. No. 324,300**

**Claims priority, application Japan, Jan. 31, 1972, 47-12891; Apr. 18, 1972, 47-46233**

**Int. Cl. F28b** *3/08*

**U.S. Cl. 165—166** **5 Claims**




A heat exchanger for heat exchange between low-temperature and high-pressure air and high-temperature and low-pressure gas comprising a housing, a plurality of partition members disposed substantially radially in the housing for defining therebetween alternate air and gas passages for passing the air and gas in directions opposite to each other, a first corrugated fin disposed in each air passage, and a second corrugated fin disposed in each gas passage. The first fins are suitably cut out at one end thereof to communicate with an air inlet of the heat exchanger, and the second fins are suitably cut out at the end remote from the cut-out end of the first fins to communicate with a gas inlet of the heat exchanger so as to attain satisfactory heat exchange between the two fluids.

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**3,818,985**

## APPARATUS FOR POURING MOLTEN METAL FROM A LADLE

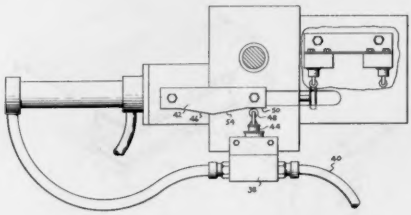
**William Russell Smith, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.**

**Filed Aug. 4, 1972, Ser. No. 278,154**

**Int. Cl. B22d** *13/10*

**U.S. Cl. 164—300** **3 Claims**

High quality centrifugally cast cylindrical members are obtained by varying the rate of rotation of the metal pouring ladle during casting to obtain a more rapid angular displacement of the ladle at the initiation and termination of the pour than at the middle of the pour. Because the weight of the molten metal tending to discharge the metal from the ladle varies inversely with angular displacement of the ladle, i.e., the weight of molten metal at the discharge lip is maximum at the middle of the pour cycle, a substantially constant volume of




metal is discharged throughout the pour. In a preferred embodiment of this invention, the rate of displacement of the ladle during the pour is symmetrical with the rate of ladle displacement being reduced from a predetermined speed during the first half of the pour and gradually increased to approximately the initial ladle displacement rate over the second half of the pour.

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**3,818,986**

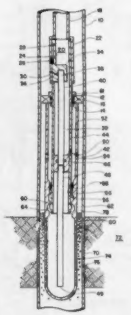
## SELECTIVE WELL TREATING AND GRAVEL PACKING APPARATUS

**Dave L. Abney; Robert C. Williams, both of Dallas, Tex., and Horace E. Gilbert, Gretna, La., assignors to Dresser Industries, Inc., Dallas, Tex.**

**Filed Nov. 1, 1971, Ser. No. 194,228**

**Int. Cl. E21b** *43/04, 43/10*

**U.S. Cl. 166—51** **7 Claims**



The apparatus and method provides the ability to selectively treat a producing zone in a well and to gravel pack an annulus in the well casing outside a screen type liner pipe. A tubing string extending from the surface of the well bore is connected to a packer by a crossover valve. Flow down the tubing string is directed to an annulus below the packer, then inwardly through the screen type liner, then upward through the crossover into the annulus above the packer and then to the earth's surface. Communication from the crossover to the annulus above the packer may be selectively closed to permit a treating pressure to be exerted down the tubing to force a treating fluid into the producing zone. The treating pressure is isolated from the casing above the packer to protect the casing above the packer.

## 3,818,987
## WELL PACKER AND RETRIEVER

**Gary D. Ellis, Dallas, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.**

**Filed Nov. 17, 1972, Ser. No. 307,696**
**Int. Cl. E21b** *23/06*
**U.S. Cl. 166—134** **15 Claims**

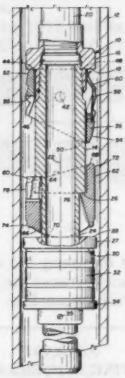
A well packer to be set in a casing has a cylindrical mandrel with a resilient packer unit encircling the mandrel which is radially expandable into contact with the casing when longitudinally compressed. A drive cylinder is secured to the mandrel below the packer unit to support the unit. A lower cylinder encircles the mandrel to bear against the top of the packer unit and is freely movable longitudinally on the mandrel. A hollow cylindrical bidirectional grip has beveled generally parallel ends with toothed shoulders adjacent to opposite extremities of the beveled ends. The grip is mounted on the mandrel and bears on the lower cylinder as to be tilted into engagement with the casing but normally is resiliently biased toward an untilted attitude. An upper cylinder encircles the mandrel and is slidably positioned thereon above the grip. Forces acting upward on the mandrel and downward on the upper cylinder apply a setting force to the grip which force is transmitted through the packer unit whereby the grip tilts toward and becomes wedged between opposite sides of the casing as the packer unit is forced into casing contact to seal the annulus between the mandrel and the casing.

## 3,818,988
## WELL PACKER

**Norman Weldon Read, Dallas, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.**

**Filed Jan. 2, 1973, Ser. No. 320,221**
**Int. Cl. E21b** *23/00*
**U.S. Cl. 166—140** **10 Claims**

The improved well packer disclosed herein includes a tubular body arranged at one end for connection with a running string, a unitary gripping member positioned on the body and movable between a casing engaging position and a retracted position, and an articulated head member located on the tubular body having an upper end engagable with the lower end of the gripping member and also being engagable with the casing. The lower end of the articulated head member is engagable with a movable abutment positioned on the tubular body. The well packer also includes packing means located on the tubular body that is arranged to be deformed into sealing engagement with the casing. The articulated head member engages the unitary gripping member and the casing to transfer a portion of the eccentric load of the gripping member into the casing and thus prevent the imposition of a moment on the tubular body. The lower end of the articulated head engages the

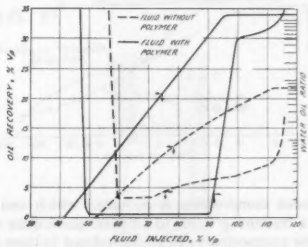


abutment member parallel to the axial centerline of the tubular body.

## 3,818,989
## METHOD FOR PREFERENTIALLY PRODUCING PETROLEUM FROM RESERVOIRS CONTAINING OIL AND WATER

**Charles A. Christopher, Jr., Houston, and Abdus Satter, Conroe, both of Tex., assignors to Texaco, Inc., New York, N.Y.**

**Filed Dec. 27, 1972, Ser. No. 319,067**
**Int. Cl. E21b** *43/22*
**U.S. Cl. 166—274** **6 Claims**




In a subterranean reservoir containing both petroleum and water interspersed, the petroleum may be preferentially produced by injecting into one well penetrating the reservoir a slug of fluid comprising LPG, colloidal silica, water and a polymeric material followed by a driving fluid comprising water to force the reservoir fluids into another well penetrating the reservoir where they are produced.

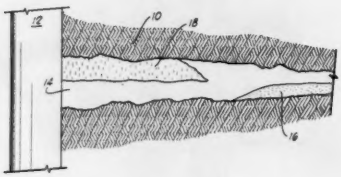
## 3,818,990
## METHOD FOR CONTROLLING MOVEMENT OF LIQUIDS AND SOLIDS THROUGH A SUBTERRANEAN FRACTURE

**Gerald R. Coulter, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.**

**Filed Jan. 29, 1973, Ser. No. 327,343**
**Int. Cl. E21b** *43/26, 33/138*
**U.S. Cl. 166—280** **15 Claims**

A method for controlling movement of liquids and solids through a subterranean fracture comprising placing a bed of a propping agent in the lower portion of a vertical fracture in a subterranean formation; placing a substantially impermeable

solid material in the fracture over the proppant bed; then, directing a fluid through the fracture at a pressure sufficient to displace at least a portion of the propping agent below the




solid material without displacing the solid material, and to form a fluid flow channel between the solid material and the remaining portion of the proppant bed.

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**3,818,991**

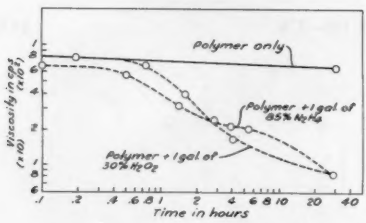
**METHOD OF TREATING SUBTERRANEAN FORMATION WITH A COMPOSITION OF IMPROVED VISCOSITY CONTROL**

**Kenneth H. Nimerick, Tulsa, Okla., assignor to The Dow Chemical Company, Midland, Mich.**

**Division of Ser. No. 145,495, May 20, 1971, Pat. No. 3,779,914, which is a continuation-in-part of Ser. No. 666,853, Sept. 11, 1967, abandoned. This application Aug. 27, 1973, Ser. No. 391,719**

**Int. Cl. E21b** *43/26*

**U.S. Cl. 166—283** **10 Claims**




An aqueous composition is provided which can be employed as a fracturing fluid, to suspend particulate solids or the like. The composition can be formulated to have a certain initial viscosity value which will decrease after a certain period of time to a value below the initial viscosity value. The composition comprises, water, a water soluble organic polymer as a viscosity increasing agent and as a breaker a hydrazine or hydroxylamine compound or a mixture of such compounds.

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**3,818,992**

**WELL DRILLING, COMPLETION AND PRODUCTION IN PERMAFROST**

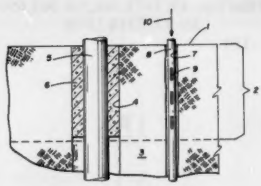
**Thomas K. Perkins, Dallas, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.**

**Filed Mar. 9, 1973, Ser. No. 339,513**

**Int. Cl. E21b** *43/00*

**U.S. Cl. 166—305 R** **5 Claims**

A method and apparatus for drilling, completing, and/or producing a well through a permafrost zone wherein a liquid such as water is either introduced into a thawed region of the permafrost to prevent compaction of the permafrost or liquid is removed from a thawed region in the permafrost zone to prevent the generation of abnormal pressures on a wellbore and/or apparatus therein should the liquid freeze. A method for completing a well in a permafrost zone wherein a pipe is run into the wellbore adjacent to the casing and the pipe is perforated after placement in the wellbore to provide means




for introducing liquid into and removing liquid from the permafrost zone.

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**3,818,993**

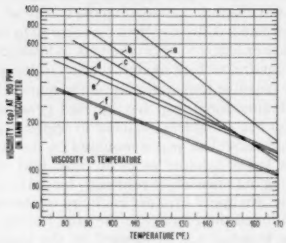
**LPG MICELLAR SOLUTIONS AS FRACTURING FLUIDS**

**William B. Gogarty, Littleton, and Gerald W. Haws, Denver, both of Colo., assignors to Marathon Oil Company, Findlay, Ohio**

**Filed Jan. 3, 1972, Ser. No. 214,848**

**Int. Cl. E21b** *43/26*

**U.S. Cl. 166—308** **13 Claims**




A fracturing fluid successfully useful for stimulating gas producing wells is obtained by mixing 60–95 percent by volume of a hydrocarbon containing an average of C-3 to about C-10 carbon atoms, up to 20 percent by volume of water, 2.5 to about 25 percent of a surfactant obtained by condensing about 1 mole of an alcohol containing about 4 to about 20 carbon atoms with about 1 to about 20 moles of an alkene oxide to obtain a surfactant having a HLB (hydrophil-lipophil balance) of about 3 to about 15, and optionally containing 0.1 to about 10 percent by volume of a cosurfactant which can be an alcohol containing 1 to about 10 carbon atoms and/or about 0.001 to about 5 percent by weight (based on aqueous medium) of an electrolyte. In addition, the fracturing fluid can contain propping agents, fluid loss control agents, corrosion inhibitors, diverting agents, and other additives desired for a particular fracturing process.

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**3,818,994**

**DISCHARGE HEAD HAVING A MAGNETIC PLUG RETAINING ASSEMBLY**

**William L. Livingston, Sharon, Mass., assignor to Factory Mutual Research Corporation, Norwood, Mass.**

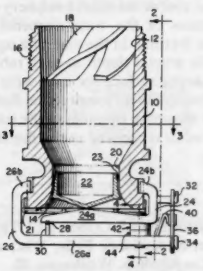
**Filed June 7, 1973, Ser. No. 367,735**

**Int. Cl. A62c** *37/08*

**U.S. Cl. 169—37** **22 Claims**

A pressure responsive discharge head wherein an expellable plug is disposed in the outlet of a body member having an inlet

adapted for connection to a source of extinguishant. A magnetic assembly applies a magnetic force to retain the plug in



the outlet in the absence of a predetermined fluid pressure in the body member sufficient to overcome the magnetic force.

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**3,818,995**

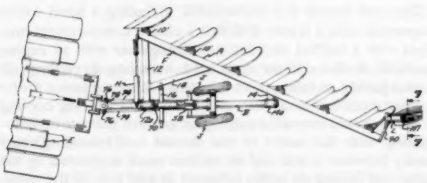
**TWO WAY PLOW WITH ARTICULATED CENTER WHEEL AND AUTOMATICALLY LOCKABLE REAR WHEEL**

**William F. Mellen, Anaheim, Calif., assignor to Alice Marian Mellen, Anaheim, Calif.**

**Continuation-in-part of Ser. No. 262,356, June 13, 1972, Pat. No. 3,771,607. This application June 8, 1973, Ser. No. 368,443**

**Int. Cl. A01b** *3/28*

**U.S. Cl. 172—212** **9 Claims**



A two way plow capable of being drawn by a power vehicle having a vertically movable hitch. The plow includes an elongate rearwardly extending draft member that pivotally supports a plow bottom supporting assembly that by hydraulically operated means may be placed on either side of the draft member for plowing purposes. A first vertically movable, hydraulically controlled wheel assembly is located at a position intermediate the ends of the draft member, with the wheel assembly capable of being moved upwardly relative to the draft member as the latter is lowered by manipulation of the hitch to maintain the draft member in a horizontal position. The first wheel assembly when in an elevated position is free to pivot relative thereto, but when lowered relative to the draft member to maintain the plow bottom supporting assembly in a non-plowing position, such as is necessary when the plow is being transported or turned around in the headland, the wheel assembly interlocks with articulate means and the wheel assembly thereafter pivots in a direction to cause the wheel assembly to track with the path of the power vehicle. A second wheel assembly is so movably supported from the rear of the draft member that the second wheel assembly automatically assumes a locked angular position relative to the draft member to compensate for side thrust developed by the bottom in moving through the soil when the plow bottom supporting assembly is pivoted from one side of the draft member to the other side thereof.

**3,818,996**

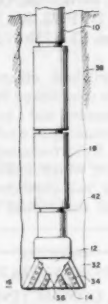
**REPULSING CLAYS ON DRILL BITS**

**Stanley B. McCaleb, Richardson, Tex., assignor to Sun Oil Company, Dallas, Tex.**

**Filed Oct. 10, 1972, Ser. No. 296,358**

**Int. Cl. E21b** *7/00, 17/00*

**U.S. Cl. 175—57** **10 Claims**



Bit balling is prevented by impressing a negative electrical charge on the drill bit by the use of bi-metallic electromotive potential differences, batteries or other electrical energy sources.

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**3,818,997**

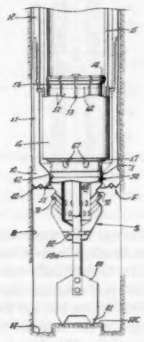
**APPARATUS AND METHOD FOR SITU SHARPENING OF BORE HOLE BITS**

**Harold C. Bridwell, Salt Lake City, Utah, assignor to Christensen Diamond Products Company, Salt Lake City, Utah**

**Filed Nov. 6, 1972, Ser. No. 304,224**

**Int. Cl. E21b** *41/00*

**U.S. Cl. 175—57** **29 Claims**



An impregnated diamond core bit is sharpened at the bottom of a bore hole, the bit being secured to the outer barrel of coring apparatus attached to a tubular drill string extending to the top of the bore hole. A sharpener is releasably mounted in the lower end of an inner core barrel lowered through the drill string into the outer barrel and latched thereto, with the sharpener projecting below the lower end of the core bit, the sharpener having nozzles for discharging abrasive material pumped through the sharpener against the drilling face of the bit to sharpen the same, whereupon the coring operation can be effected in the usual manner, the core releasing the sharpener from the inner barrel and pushing it upwardly along and within the inner barrel as the core is formed. The sharpener is retrieved with the inner barrel upon release of the latter from

the outer barrel and its upward removal through the drill string to the top of the bore hole.

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**3,818,998**

## METHOD OF REDUCING LOST CIRCULATION DURING WELL DRILLING

**James E. Hessert, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.**

**Filed June 27, 1972, Ser. No. 266,684**
**Int. Cl. E21b** *21/04*
**U.S. Cl. 175—72** **11 Claims**

Water-dispersible cellulose ethers, polysaccharides and polyarcylamides can be crosslinked by contacting with a hexavalent chromium compound and a polyhydric alcohol. Crosslinking results in the formation of a rubbery gel which swells in the presence of water. By introducing the gell into a permeable subterranean zone, to which drilling fluid is being lost during a drilling operation, and contacting it with water, the gel can be caused to swell and reduce the permeability of the zone.

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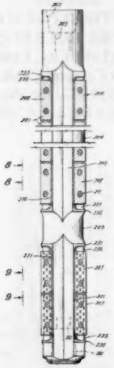
**3,818,999**

## WALL CONTACTING TOOL

**William R. Garrett, Midland, Tex., assignor to Smith International Inc., Midland, Tex.**

**Continuation of Ser. No. 38,715, May 19, 1970, abandoned.**
**This application Nov. 8, 1971, Ser. No. 196,815**
**Int. Cl. E21b** *17/10;* **E21c** *9/00*
**U.S. Cl. 175—325** **19 Claims**



A drill string wall contacting tool, suitable for deviation control and/or bit stabilization is provided with replaceable wall contacting elements. Generically the tool is of the rotating fixed blade stabilizer type wherein the wall contacting elements rotate with the drill string but are fixed relative thereto, there being fluid passages in the sides of the tool which divide it azimuthally into a plurality of blades at whose periphery are the wall contacting surfaces. Preferably the tool is a four bladed stabilizer of the species known as a square drill collar. The wall contacting tool is grooved longitudinally at its outermost periphery. i.e., the corners of the square drill collar, and includes field replaceable wear elements received in the grooves and secured in place by radially-directed screws engaging holes in locking dowel pins releasably carried by the tool. The dowel pins extend into engagement with transverse mortises in the wear elements. There is more clearance between the screws and wear elements than between the dowel pins and wear elements so that all loads on the wear elements in the direction of the length of the grooves are taken by the dowel pins rather than the screws. Since the sides of the grooves take all loads on the wear elements in the direction tangent to the tool periphery, the screws are not required to take any load transverse to the screw axis. There is sufficient clearance to insure equal tightness of both sides of the wear elements with the adjacent grooves as the screws are tightened. Angle tolerances are set to insure initial contact of wear elements and tool at the outer periphery of the tool to insure lateral tightness of the wear elements in the groove, thereby to prevent fretting. In the case of a square drill collar, in order to provide greater depth to each rabbet and a larger arcuate wall contacting surface for each wear element, and at the same time allow sufficient longitudinal fluid passage space between the wear elements, the sides of the collar between the rabbets are relieved as compared to the flat sides of the usual square drill collar.

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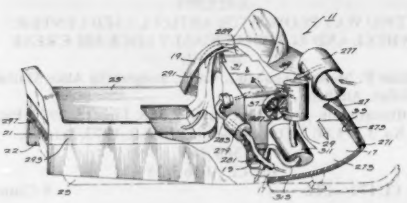
**3,819,000**

## SNOWMOBILE CONSTRUCTION

**Robert T. Larsen, Menomonee Falls, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.**

**Filed Oct. 12, 1972, Ser. No. 296,975**
**Int. Cl. B60k** *11/06*
**U.S. Cl. 180—5 R** **9 Claims**



Disclosed herein is a snowmobile including a hood which cooperates with a frame to define a closed compartment provided with a baffled air inlet means, together with an engine mounted in the compartment and including a cooling air shroud having an inlet communicating with the interior of the compartment and an outlet, and a fan for delivering cooling air through said shroud, a cooling air exhaust passage communicating with the outlet of the shroud and extending rearwardly between a seat and an endless track supported by the frame and having an outlet adjacent to said rear of the snowmobile. Also included in the compartment is a carburetor air inlet silencer having an inlet communicating with the interior of the compartment and an outlet communicating with the engine.

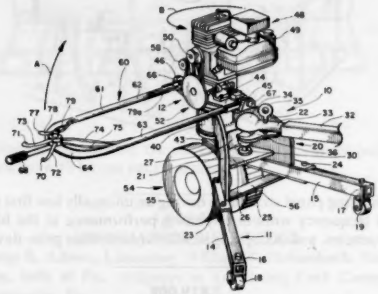
Also disclosed is a mounting system for an alternate firing internal combustion engine including a crankshaft and two cylinders and a plurality of resilient mounts supporting the engine from a frame with the axis of the crankshaft extending transversely of the frame and with the cylinder axes located in a generally vertical plane extending transversely of the frame. The resilient mounts are relatively soft in the vertical direction and relatively stiff in the direction transverse to the vertical direction and transverse to the crankshaft axis. Mounted on the engine crankshaft is the primary pulley of a variable speed transmission, which pulley is drivingly connected to a secondary pulley mounted from the frame forwardly of the crankshaft in the direction of relative stiffness of the mount.

Also disclosed is a bearing support including a housing supported from the snowmobile frame and including wall means defining a bore for passage of a shaft transmitting power from the engine, and a cavity extending outwardly from the bore, a bearing retainer located in the cavity, a bearing unit supported by the bearing retainer and engaging the shaft to permit shaft rotation relative to the retainer, and means located in the cavity and extending between the housing and the retainer for preventing transmission of sound and vibration from the retainer to the housing and for simultaneously preventing displacement of the retainer relative to the housing.

### 3,819,001
### TRACTOR WITH FULL SWIVEL FRONT SECTION

Clement C. Pavelka, 376 Orange Dr., Oxnard, Calif. 93030

Filed Aug. 2, 1973, Ser. No. 385,066
Int. Cl. B62d 51/04
U.S. Cl. 180—19 H 20 Claims

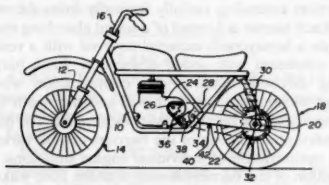


A tractor has a mobile frame section carrying a hitch for connection with a mobile home or the like and a front section capable of being fully swivelled about its axis. Arching upwardly and forwardly from the mobile frame is a neck that is rigidly connected to a vertically disposed barrel which rotatably mounts a drum associated with the tractor front section. A columnar chassis extends from the axle and entirely through the drum so an upper part can support a motor and pivotally mount a steering mechanism. The steering mechanism is a U-shaped swing bar that can be maneuvered through a broad arc to clear the motor and other components while being swung from one side of the tractor to the other.

### 3,819,002
### DRIVE SYSTEM

Hewart H. Heathwaite, and Robert H. Mead, both of Ithaca, N.Y., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Aug. 29, 1972, Ser. No. 284,691
Int. Cl. B62m 9/02
U.S. Cl. 180—32 1 Claim



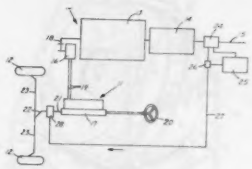
A power driven vehicle having a drive chain transmitting power from an engine to a driven wheel capable of moving between various positions and means for maintaining substantially constant final drive chain tension for all wheel positions.

### 3,819,003
### AUTOMATICALLY VARYING POWER STEERING FOR MOTOR VEHICLES

Roger Daniel Walker, 4003 Raleigh St., Denver, Colo. 80212

Filed Nov. 16, 1972, Ser. No. 307,127
Int. Cl. B62d 5/06
U.S. Cl. 180—79.2 R 6 Claims

A power steering system device for automatically varying, with respect to speed, the necessary steering forces to be exerted by a vehicle driver, including a centrifugal pump driven by the output drive shaft of the vehicle and a power steering shaft restraining device responsive to the output pressure from the shaft driven pump. As speed of the vehicle increases the

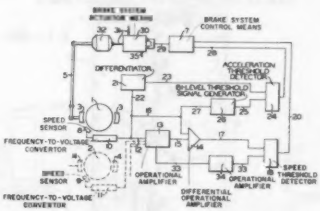


driver is required to exert more steering force. The restraining means can be provided in the form of a friction brake which is applied against the steering shaft.

### 3,819,004
### METHOD AND APPARATUS FOR PREVENTING WHEEL SLIP

Joseph Adde, Montfermeil, France, assignor to Compagnie Des Freins et Signaux Westinghouse, Freinville-Sevran, France

Filed June 8, 1972, Ser. No. 260,971
Claims priority, application France, June 11, 1971, 71.21382
Int. Cl. B60k 27/02; B60t 8/08
U.S. Cl. 180—82 R 1 Claim




The present invention concerns a method for preventing the skidding and slipping of the wheels of a single vehicle, or a train of coupled vehicles, and electronic apparatus for the application of this method. The present invention applies especially, but not exclusively, to the braking systems of trains and automobiles, the control of electrical valves for the admission and exhaust of fluids under pressure which activate the braking devices of a single vehicle or a train of coupled vehicles, this control being carried out as a function of the speed of the wheels.

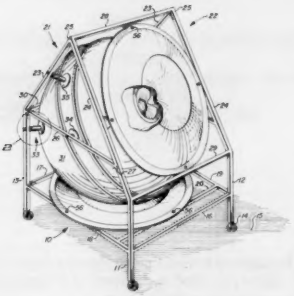
### 3,819,005
### LOUDSPEAKER CABINET WITH SOUND REFLECTORS

James R. Westlund, 6879 E. Cholla St., Scottsdale, Ariz. 85254

Filed Jan. 22, 1973, Ser. No. 325,537
Int. Cl. G10k 13/00; H04r 1/28
U.S. Cl. 181—31 A 6 Claims

This specification discloses a loudspeaker cabinet comprising a frame on which is mounted a spherical receptacle carrying a pair of loudspeakers in angularly spaced relation, together with a sound reflector operatively associated with each speaker and of a special design. Each reflector is of fiberglass and has an inner reflecting surface consisting of two concave annular surfaces which meet at an apical line. The

inner of these annular surfaces is generated by rotating an arc of a circle through 360° with an end of the arc the pivot point.



The outer annular surface is generated by moving an arc of another circle through 360°

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**3,819,006**

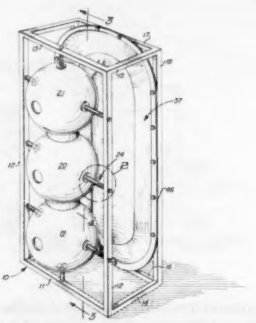
**LOUDSPEAKER CABINET WITH SOUND REFLECTORS**

**James R. Westlund, 6879 E. Cholla St., Scottsdale, Ariz. 85254**

**Continuation-in-part of Ser. No. 325,537, Jan. 22, 1973. This application Feb. 12, 1973, Ser. No. 331,384**

**Int. Cl. G10k** *13/00;* **H04r** *1/28*

**U.S. Cl. 181—31 A** **2 Claims**



This specification discloses a loudspeaker cabinet comprising a frame on which is mounted a plurality of spherical receptacles in alignment with each receptacle having a loudspeaker mounted therein and a sound reflector common to all of the speakers and consisting of a generally oval shape fiberglass member presenting a compound concave reflecting surface characterized by a central apical ridge that is located closely adjacent to the loudspeakers.

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**3,819,007**

**CONTROLLABLE LAMINAR SOUND ABSORPTIVE STRUCTURE**

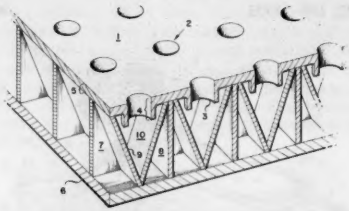
**Leslie Spencer Wirt, Newhall, and Duane Lloyd Morrow, Saugus, both of Calif., assignors to Lockheed Aircraft Corporation, Burbank, Calif.**

**Filed Apr. 27, 1973, Ser. No. 355,161**

**Int. Cl. E04b** *1/82*

**U.S. Cl. 181—33 G** **12 Claims**

An acoustical facing sheet comprising a permeable member having perforations therethrough and tubular elements extending therefrom on one side in register with said perforations. The structure provides a lumped acoustic impedance having an acoustic resistance proportional to frequency, and an acoustic inertance that is inversely proportional to frequency. It permits the design of highly efficient laminar-type sound



attenuating panel structures having an unusually low first resonant frequency without impairing performance at the higher frequencies, and occupying smaller volume than prior devices.

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**3,819,008**

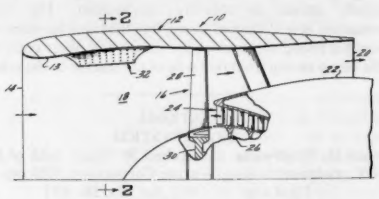
**BROAD BAND ACOUSTIC BARRIER**

**Robert C. Evans, and Horst W. Hehmann, both of Cincinnati, Ohio, assignors to General Electric Company, Cincinnati, Ohio**

**Filed Oct. 19, 1972, Ser. No. 299,159**

**Int. Cl. E04b** *1/99;* **G10k** *11/08*

**U.S. Cl. 181—33 D** **12 Claims**



The entrance to a fan duct of a gas turbine engine is provided with a plurality of circumferentially spaced projections or barriers extending radially inwardly from the wall of the duct. Each barrier is formed of a sound absorbing material, for example a honeycomb material covered with a resistive face sheet consistent with sound absorption. Each barrier has a varying circumferential width configuration wherein the greatest width abuts the duct wall and the width tapers to a minimum near the radially inwardmost point. The number and circumferential spacing of the barriers can be varied according to optimization of individual engine situations. The axial disposition of the barriers is such that the fluid wakes created thereby are substantially attenuated before interference with the fan blade.

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**3,819,009**

**DUCT WALL ACOUSTIC TREATMENT**

**Russell E. Motsinger, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio**

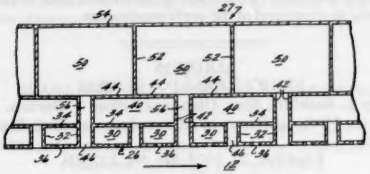
**Filed Feb. 1, 1973, Ser. No. 328,713**

**Int. Cl. E04b** *1/84*

**U.S. Cl. 181—33 G** **5 Claims**

A duct wall is provided with acoustic sound suppressing treatment comprising a panel including a plurality of cavities. The cavities are of various volumes and are intermixed according to volume within the panel along the duct wall. Each cavity is connected to the duct by means of a neck passage which provides substantially direct communication therebetween. Preselected of the cavities are spaced from the

duct by predetermined non-uniform distances so that a variety of frequency bands are suppressed. Generally, larger volume



cavities are spaced from the duct by greater distances and are associated with longer neck passages.

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**3,819,010**

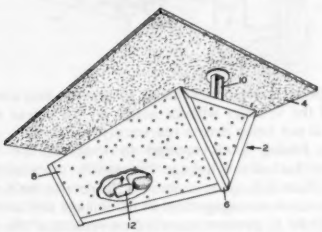
**SOUND-ABSORBING WEDGE**

**George R. Adams, Lancaster; William R. Meisenbach, Columbia, both of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.**

**Filed Nov. 1, 1972, Ser. No. 302,653**

**Int. Cl. E04g** *1/99*; **G10k** *11/04*

**U.S. Cl. 181—33 GD** **3 Claims**



A wedge-shape sound-absorbing structure is positioned and hung from a conventional ceiling system. The wedge functions as the sound-absorbing structure to limit noise exposure in industrial areas. The wedge is formed of boards which have a sound-absorbing characteristic.

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**3,819,011**

**INFLATABLE ESCAPE SLIDEWAY APPARATUS**

**Takeo Kinase; Akiyoshi Higuchi, and Akira Inokuma, all of Sagamihara, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan**

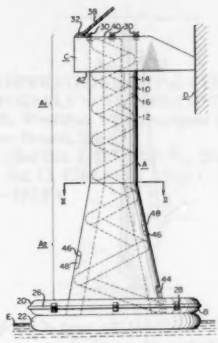
**Filed Oct. 12, 1972, Ser. No. 296,764**

**Claims priority, application Japan, Oct. 19, 1971, 46-96541; Feb. 22, 1972, 47-22000; May 31, 1972, 47-63992; May 31, 1972, 47-63994**

**Int. Cl. A62b** *1/20*

**U.S. Cl. 182—48** **20 Claims**

The disclosed apparatus includes a collapsible helical balloon filled with a pressurized gas to provide a helical slideway vertically extending. The balloon has an upper half including convolutions constant in diameter and a lower half including convolutions gradually increased in diameter toward its end and is sandwiched in fixed relationship between a pair of collapsible outer and inner tubular members. A horizontal platform provided with an entrance to the slideway projects from the boardside of a ship to hang down both tubular members at their upper ends. The tubular members are connected at their lower ends to a collapsible float unit floating on the sea surface. The outer tubular member is provided on the lower end portion with an exit to the float unit. The lower half of the helical balloon can also be confined in a spiral space formed of a vertically extended collapsible spiral member connected to the lower edges of the outer and inner members terminating



adjacent its upper end and having the outermost convolution located outside of the outer tubular member.

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**3,819,012**

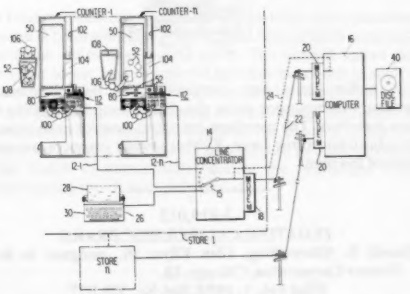
**MERCHANDISE HANDLING AND IDENTIFYING SYSTEM**

**Francis Xavier Beck, Jr., Cherry Hill, and William Edward Kinslow, Jr., Willingboro, both of N.J., assignors to RCA Corporation, New York, N.Y.**

**Filed Mar. 20, 1970, Ser. No. 21,425**

**Int. Cl. E04h** *3/04*

**U.S. Cl. 186—1 A** **1 Claim**




A conveyer carries articles identified by machine readable markings toward a read station. When the articles reach the end of the conveyer, they are manually moved past the read station and into a bag or other container, in one continuous operation. A check automatically is made of the markings on each article. In addition, each time an article is read, its price automatically is displayed and its inventory is updated.

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**3,819,013**

**TOBACCO HOIST**

**A. Elmer Crum, 1040 Carson St., Greenville, Tenn. 37743**

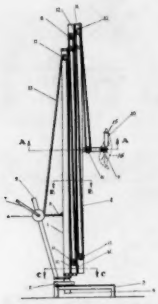
**Filed Aug. 1, 1972, Ser. No. 276,970**

**Int. Cl. B66b** *9/06*

**U.S. Cl. 187—11** **3 Claims**

A hoist for raising sticks containing uncured tobacco suspended therefrom into the loft of a barn or other tobacco

curing area and manipulating the sticks to position horizontally suspended across the joists of the loft. This is done by one



person at ground level without the need of a helper in the loft to manipulate the sticks.

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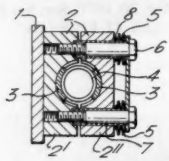
**3,819,014**

## BUFFER ARRANGEMENT

**Kjell Sverre Mortensen, Raadal, Norway, assignor to Sverre Munck A/S, Bergen, Norway**

**Filed Dec. 11, 1972, Ser. No. 313,628**
**Claims priority, application Norway, Dec. 9, 1971, 4542/71**
**Int. Cl. F16f** *7/08*
**U.S. Cl. 188—1 B** **2 Claims**



A buffer for a pipe comprising two friction members secured to a mounting plate, the pipe passing through the friction members. The members are urged towards each other by an adjustable spring force. Rubber impact stoppers are on the ends of the pipe.

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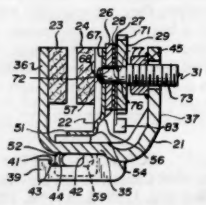
**3,819,015**

## FLOATING CALIPER DISC BRAKE

**Russell E. Silberschlag, Glen Ellyn, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.**

**Filed Feb. 1, 1973, Ser. No. 328,827**
**Int. Cl. F16d** *55/30*
**U.S. Cl. 188—73.3** **5 Claims**



A caliper disc brake unit is provided with mounting means which anchor the unit in one plane while permitting floating movement in two other mutually perpendicular planes in order to follow any wobbling that might occur in a rotary member with which the brake is engaged. The unit is also provided with self-adjusting means which compensates for wear of the friction pads. Adjustment of the friction pads occurs in response to overtravel of the apply mechanism.

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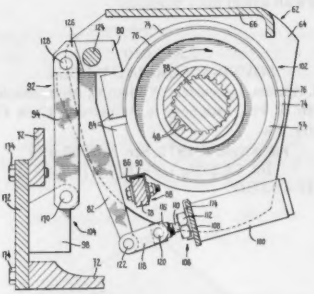
**3,819,016**

## VEHICLE BRAKING SYSTEM

**Stanley L. Radcliffe, Stow, Ohio, and Arthur E. Dornan, Ann Arbor, Mich., assignors to Massex-Ferguson Inc., Detroit, Mich.**

**Filed Feb. 22, 1972, Ser. No. 227,836**
**Int. Cl. F16d** *63/00*
**U.S. Cl. 188—82.6** **6 Claims**



A braking system for vehicles to prevent rearward movement of the vehicles without action by the driver when the vehicle is not being driven rearwardly, particularly useful on vehicles having loads applied to them in the rearward direction, includes a linkage operatively associated with a brake, which linkage is responsive to reverse motion of the vehicles, to cause engagement of the linkage and energization of the brake to prevent rearward movement of the vehicles. Control means, such as a clutch, responsive to rearward movement of the vehicle may be used to selectively energize and de-energize the brake.

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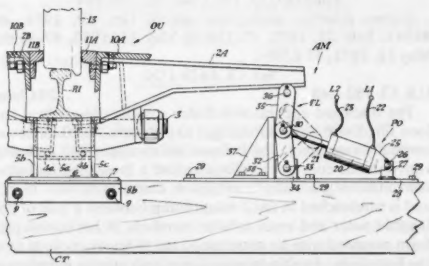
**3,819,017**

## CONTROLLABLE SKATE CAR RETARDER

**Peter M. Noble, Valencia, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.**

**Filed Jan. 2, 1973, Ser. No. 320,323**
**Int. Cl. B61k** *7/08*
**U.S. Cl. 188—62** **10 Claims**



This invention relates to a controllable railway skate car retarder including a plurality of levers pivotally supported on the cross ties and disposed on the respective sides of a track rail. The pivotal levers support elongated braking elements which are disposed parallel to the track rails. Each of the outer levers

of the car retarder is operated by a power actuator. Each power actuator includes a fluid operated piston and cylinder as well as a mechanical toggle linkage to raise and lower the levers to cause the braking elements to assume a braking or nonbraking position.

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**3,819,018**

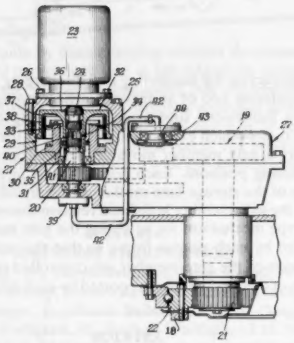
## BRAKE ASSEMBLY FOR EXCAVATOR SWING TRANSMISSION

**Thomas P. Muller, Aurora, and Gary L. Popdan, Oswego, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.**

**Filed Dec. 4, 1972, Ser. No. 311,876**

**Int. Cl. F16d** *67/04*

**U.S. Cl. 192—8 R** **10 Claims**



An excavator has a revolving upper unit rotatably mounted on a mobile undercarriage. The upper unit has a drive motor mounted thereon which rotates a swing pinion through a speed reduction gear train of a transmission for selectively revolving the upper unit on the undercarriage. A brake assembly is operatively connected between an output shaft of the drive motor and an input shaft to the transmission to selectively prevent rotation of the swing pinion. The braking means includes a coupling member splined between the input and output shafts and a pump is operatively connected to the input shaft to communicate lubricating oil to the spline connection, through a passage formed in the input shaft.

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**3,819,019**

## SPRAG FOR FREE-WHEELING CLUTCH

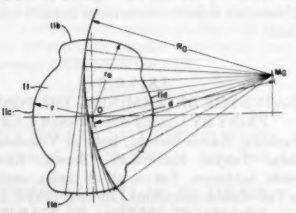
**Karlheinz Timtner, Bad Homburg, Germany, assignor to Ringspann Albrecht Maurer KG, Bad Homburg, Germany**

**Filed Jan. 31, 1973, Ser. No. 328,243**

**Claims priority, application Germany, Jan. 31, 1972, 2204305**

**Int. Cl. F16d** *41/07*

**U.S. Cl. 192—41 A** **6 Claims**



A free-wheeling clutch sprag which is given a smooth and gradual sprag angle variation in the minimum sprag height range by giving at least one of the sprag surfaces which contacts a race the form of an involute cylinder.

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**3,819,020**

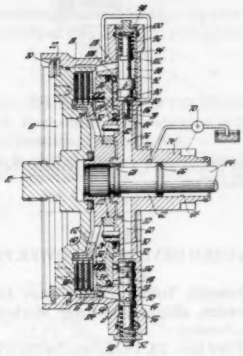
## FLUID OPERATED STARTING CLUTCH WITH CENTRIFUGALLY ACTUATED CONTROL VALVES

**Lyle B. Smith, Westland, Mich., assignor to General Motors Corporation, Detroit, Mich.**

**Filed Oct. 2, 1972, Ser. No. 293,927**

**Int. Cl. F16d** *43/06, 25/063, 13/74*

**U.S. Cl. 192—103 FA** **3 Claims**



A fluid operated starting clutch in which the apply chamber pressure is controlled by an apply restriction control valve and an exhaust restriction control valve. The control valves are responsive to the input rotational speed of the clutch in such a manner as to provide a speed differential between opening of the apply restriction and closing of the exhaust restriction so that smooth clutch apply is obtained. The exhaust restriction control valve has a differential area subject to apply pressure in the clutch to substantially balance the centrifugal force therein during the clutch apply period.

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**3,819,021**

## HYDRAULIC CLUTCH WITH CONSTANT OPERATING STROKE

**Willi Schacher, and Heinz-Jurgen Beck, both of Friedrichshafen, Germany, assignors to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Germany**

**Filed Mar. 14, 1973, Ser. No. 341,243**

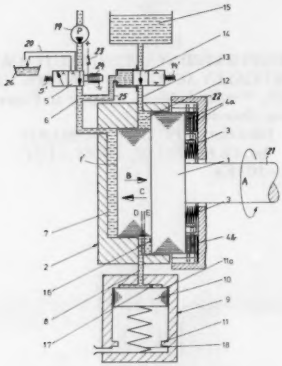
**Claims priority, application Germany, Mar. 15, 1972, 2212342**

**Int. Cl. F16d** *13/75*

**U.S. Cl. 192—111 A** **7 Claims**

A hydraulic cylinder, whose piston controls a clutch to be engaged for a predetermined period, forms with an annular face of the piston a secondary fluid space expanding during the working stroke of the piston and contracting during its return stroke. The secondary fluid space communicates with a metering chamber in which an ancillary piston is displaceable against a fixed stop. A valve responsive to the actuating fluid pressure opens on the working stroke to connect the secondary fluid space to a source of hydraulic liquid under atmospher-

ic pressure, the valve closing on the return stroke whereby the ancillary piston is displaced onto its stop and thereupon arrests the main piston after a displacement thereof over an invariable distance.



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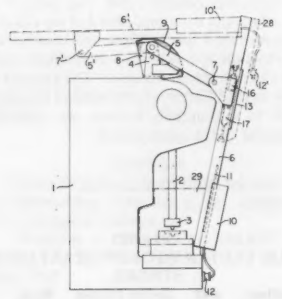
**3,819,022**

**SAFETY GUARD DEVICE FOR POWER PRESSES AND THE LIKE**

**Lars Erik Svensson, Tullinge, and Gustav Julin, Stockholm, both of Sweden, assignors to Safer Marketing Aktiebolag, Stockholm, Sweden**

**Filed Dec. 29, 1972, Ser. No. 319,735**
**Int. Cl. F16d** *71/00*
**U.S. Cl. 192—134** **6 Claims**



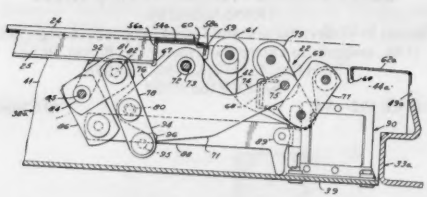
A safety guard device for a power press having a space constituting a path for inserting and taking out workpieces. A movable gate is arranged in the path and a photocell device outside the gate is arranged with the control zone thereof transverse to the longitudinal direction of the path. The gate is provided with driving and control members and the photocell device is provided with control circuits which together mechanically constitute a unit pivotally arranged at the press in such a way that the unit can be moved to a position so that the tool space of the press is easily accessible. An electrical connection is provided between the operation system of the press and the operation control circuit of the unit, which connection is such that it becomes disconnected when moving the unit.

**3,819,023**

**CONSTRUCTION FOR DISCHARGING ARTICLES FROM INCLINED STORAGE LANES**

**James F. McClelland, 40 Beacon Hill, Grosse Pointe Farms, Mich. 48236**

**Filed Aug. 10, 1972, Ser. No. 279,489**
**Int. Cl. B65f** *11/00*
**U.S. Cl. 193—40** **29 Claims**



A construction for supporting and discharging articles from the downstream end of an inclined article storage lane comprising a framework supporting and locating one or more release frames which extend longitudinally of the storage lane and carry a gate member movable between article stopping and releasing positions. Each release frame in turn supports portions of the storage lane on the upstream and downstream sides of the gate member in defined relation thereto. Improved toggle-type mechanism for actuating the gate member is also supported by each release frame so that the positioning and movements of the gate member are controlled relative to the portions of the storage lane supported by each release frame.

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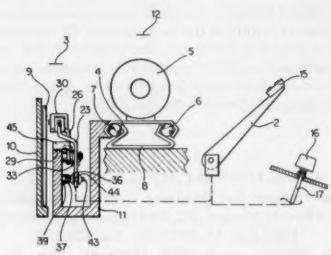
**3,819,024**

**INCREMENTAL MOTION DEVICE**

**Michael J. Markakis, Palo Alto, Calif., assignor to SCM Corporation, New York, N.Y.**

**Filed Apr. 23, 1973, Ser. No. 353,305**
**Int. Cl. B41j** *5/30*
**U.S. Cl. 197—1 R** **17 Claims**



A magnetic reader/recorder combined with a typewriter, the recording/reproducing head being mounted on the platen carriage or typehead carrier, but capable of independent substantially constant velocity movement in each character position of a line.

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**3,819,025**

**APPARATUS FOR DETERMINING THE POSITION OF PRINT BY USING A TRANSDUCER**

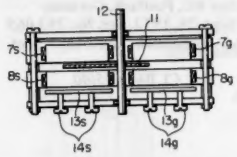
**Yoshio Fushida; Kazuo Suzuki, both of Yokohama; Takaaki Kasahara, Tokyo; Kazuyoshi Okawa, Kawasaki, and Masayoshi Ashizawa, Tokyo, all of Japan, assignors to Kurosawa Tele-Communications Limited, Tokyo, Japan**

**Filed May 17, 1972, Ser. No. 253,939**
**Int. Cl. B41j** *3/50*
**U.S. Cl. 197—1 R** **4 Claims**

With regard to the electronically driven typewriter which replaces the conventional mechanically driven typewriter, a

movable type selection system detects the angular position of print on a paper and controls various attachments.

In the movable type selection system of the electronic typewriter, it is required that the determination of the angular position of print is carried out under non contact and low inertia conditions and without receiving any effect of surrounding conditions. And further, it is required that the guidance from a present position to a commanded position is carried out over




the shortest route by discriminating whether the present position is situated on the right side or left side of the commanded position. In the present application, this discrimination is achieved by using a transducer which is provided with a magnetic shield plate that rotates between one pair of induction coils and the electromagnetic induction of the secondary induction coil varies in accordance with the angular position of the magnetic shield plate.

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**3,819,026**

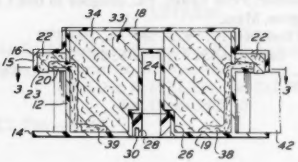
**PRINTING RIBBON SPOOL**

**Walter Ploeger, Jr., North Bellmore, Long Island, N.Y., and John W. H. Bishop, Montreal, Quebec, Canada, assignors to Walter Ploeger, Jr., North Bellmore; Walter Ploeger, Sr.; William J. Godigkeit, Jr., both of Wantagh, all of, N.Y. and John W. Bishop, Montreal, Canada, part interest to each**

**Filed Nov. 4, 1971, Ser. No. 195,710**

**Int. Cl. B41j** *31/14*

**U.S. Cl. 197—171** **10 Claims**




A printing ribbon spool are disclosed for maintaining the original print-out density or consistency of a printing ribbon by contact between a pad on the spool and a side edge of the ribbon. Ink is communicated to the pad from a sealed reservoir by way of a wick which communicates with the reservoir through a hole substantially smaller in diameter than the normal uncompressed diameter of the wick.

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**3,819,027**

**MULTIPLE UTILITY RIBBON SPOOL**

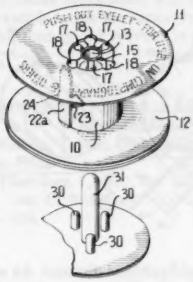
**Walter D. Landgraf, 96285 Kildaire Ave., Oak Lawn, Ill. 60453**

**Filed Dec. 21, 1971, Ser. No. 210,324**

**Int. Cl. B41j** *35/00*

**U.S. Cl. 197—175** **3 Claims**

A ribbon spool adapted to be operable with plural diverse business machines, having a removable eyelet to provide a core having openings of two different diameters according as




the eyelet is present or removed, and having two sets of drive openings, respectively of different radii and diameters.

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**3,819,028**

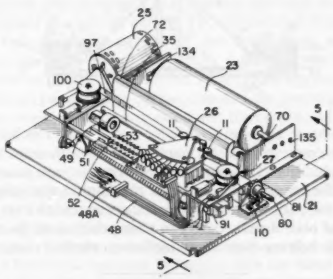
**STEPPING MECHANISM FOR TELEPRINTER**

**Jacob H. Drillick, Hackensack, N.J., assignor to International Teleprinter Corporation, Carlstadt, N.J.**

**Continuation-in-part of Ser. No. 41,514, May 28, 1970, abandoned. This application Feb. 7, 1972, Ser. No. 224,159**

**Int. Cl. B41j** *19/00*

**U.S. Cl. 197—82** **2 Claims**




A high speed teleprinter with a wire matrix print head synchronously stepped across the page, advanced by a pair of continuously reciprocating racks, and one stationary rack, cooperating with selectively operable pawls mounted on the print carriage, and controllable by the print signals. A paper feed mechanism, as an integral part of said teleprinter, which cooperates with the continuously reciprocating racks for the indexing of the surface to be printed. A ribbon feed shuttle mechanism, as an integral part of said teleprinter, which cooperates with the continuously reciprocating racks for the continuous lateral movement of the print ribbon.

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**3,819,029**

**END OF PAGE SIGNAL DEVICE FOR A TYPEWRITER**

**John T. Simmons, Jr., 31 Runnymeade Rd., Houston, Tex. 07928**

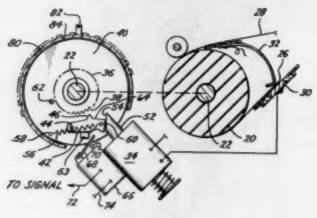
**Filed Jan. 22, 1973, Ser. No. 325,722**

**Int. Cl. B41j** *29/44*

**U.S. Cl. 197—189** **9 Claims**

An apparatus for a typewritter which will actuate an alarm for indicating when the end of a page is approaching. A solenoid actuated releasable latch carried by a rotatable member for presetting the attachment for actuating an alarm at any selected distance from the bottom of the page. A pair of electrical controls sensing the end of the page at a predetermined position and connecting the rotatable member to the platen

axle for rotation in response to a solenoid actuated by the electrical contacts, a signal switch actuated after the rotatable




member moves a predetermined distance. An adjustably positioned pin for selecting the predetermined distance the rotatable member travels before actuating the alarm.

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**3,819,030**

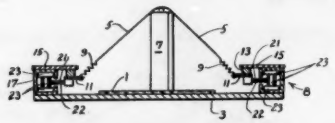
**CONVEYOR APPARATUS**

**Kent F. Warner, White Plains, N.Y., assignor to W & H Conveyor Systems, Inc., Carlstadt, N.J.**

**Filed Sept. 18, 1972, Ser. No. 289,937**

**Int. Cl. B65g *15/14***

**U.S. Cl. 198—165** **2 Claims**



A conveyor apparatus includes a conveyor mechanism, a movable conveyor belt for carrying articles thereon along a path, a plurality of elastic cords, with cover, and means connecting the cords to the conveyor mechanism spacedly transverse to the path whereby the elastic cords stretch over the articles and hold them securely in their position on the moving belt as the belt traverses sharp inclines or vertical rises.

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**3,819,031**

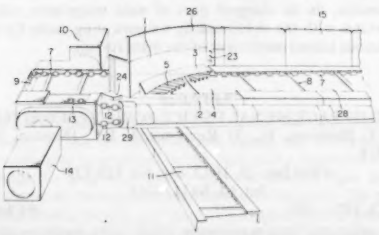
**COAL RISING DEVICE FOR USE IN A FACE CONVEYOR**

**Shigeo Nakajima, Kushiro, Japan, assignor to Taiheiyo Coal Mining Co., Ltd., Tokyo, Japan**

**Filed Feb. 12, 1973, Ser. No. 331,478**

**Int. Cl. B65g *19/00***

**U.S. Cl. 198—172** **1 Claim**



This invention relates to a resilient device for use in a face conveyor used for conveying coal when the face conveyor is equipped with a separator. Resilient elements are connected to a bottom plate of a separator frame or a face conveyor trough supporting the separator, and these resilient elements are adapted to permit only the conveyor chains and scrapers attached therebetween to pass between the separator and the bottom plate, without allowing the entry of coal.

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**3,819,032**

**CLEANING APPARATUS FOR A SHEET DELIVERY MECHANISM**

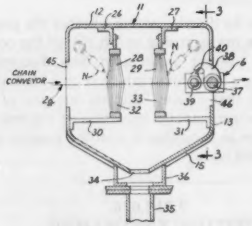
**Friedrich Preuss, Sprendlingen, and Claus Simeth, Offenbach, both of Germany, assignors to Roland Offsetmachinenfabrik Faber & Schleicher AG, Postfach, Germany**

**Filed Sept. 28, 1972, Ser. No. 293,065**

**Claims priority, application Germany, Sept. 30, 1971, 2148757**

**Int. Cl. B65g *45/00***

**U.S. Cl. 198—180** **5 Claims**




In printing apparatus, an endless chain conveyor on its return from delivery of a freshly printed and powdered sheet is cleaned by passage through a generally closed housing having brush and air nozzle means impinging on the chain and grippers thereof and exhaust means to induce an inward air flow at the entrance and exits parts of the housing.

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**3,819,033**

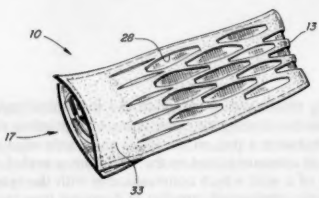
**EXPANDABLE SPECTACLE CASE**

**Edward K. Hueber, Penn Valley, Pa., assignor to Itek Corporation, Lexington, Mass.**

**Filed Oct. 10, 1972, Ser. No. 296,379**

**Int. Cl. A45c *11/04*; B65d *85/38***

**U.S. Cl. 206—5** **9 Claims**

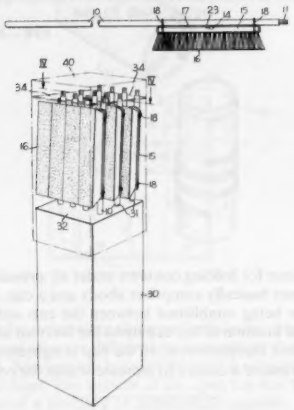


An expandable spectacle case for holding and supporting eyeglasses of widely varying size and shape. The case consists of a pair of opposed walls joined together to define a pocket therebetween for receiving the glasses. Each wall is constructed of an inner lining of elastic material capable of expanding laterally of the case to receive and hold the glasses, surrounded by an outer covering having an array of severed portions expandable into a mesh-like pattern upon expansion of the inner lining. This construction enables the case to receive glasses of differing size while ensuring that they are effectively held and protected from damage.

## 3,819,034
## SHIPPING AND DISPLAY ARRANGEMENT FOR BROOMS

John F. Clark, Milwaukee, Wis., assignor to Industries For The Blind, Incorporated, Milwaukee, Wis.

Filed Aug. 14, 1972, Ser. No. 280,666
Int. Cl. B65d 5/50, 71/00
U.S. Cl. 206—45.14 2 Claims

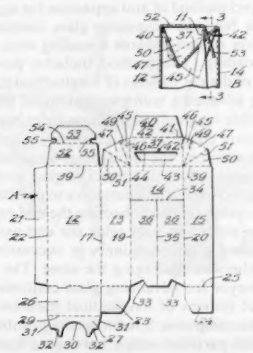


A shipping and display arrangement for push brooms has the broom handles securely fastened to the broom heads with their longitudinal axes parallel by a pair of wire clasps which frictionally engage both the handle and the lower surface of the broom head. The handles are inserted through holes in the top side of a six-sided display box so that the brooms are in the upright position for display, and a five-sided cover with open bottom fits over the display box for shipment and is removed to display the brooms.

## 3,819,035
## FRAME CARTON

Harold R. Jaeschke, Milwaukee, Wis., assignor to Hoerner Waldorf Corporation, St. Paul, Minn.

Filed Dec. 6, 1972, Ser. No. 312,607
Int. Cl. B65d 5/50
U.S. Cl. 206—45.14 7 Claims

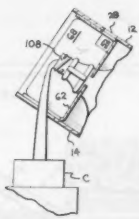


A shadow box type package supports a tube having a crimped end. The rectangular carton includes a closure including a first flap connected to one wall and inclining inwardly toward the opposite wall. This flap is apertured to receive the tube end, and includes an extension extending to the juncture between the opposite wall and a second flap. The second flap extends across the carton end and includes a tuck flap engageable through the aperture in the first flap.

## 3,819,036
## SAFETY POURING PACKAGE FOR DANGEROUS CHEMICALS

Howard L. Weldon, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Sept. 1, 1972, Ser. No. 285,808
Int. Cl. B65d 5/46, 77/00, 81/00
U.S. Cl. 206—216 4 Claims

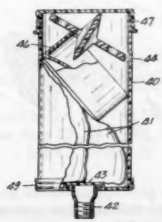


A safety pouring package for dangerous chemicals wherein the chemical is contained in a bottle. A bottle containing a dangerous chemical, such as a concentrated acid, is completely enclosed in a tubular carton. The carton is tall enough to ensure that the finish portion of the bottle does not project beyond the open end of the carton. A pouring notch is cut in one sidewall panel of the carton. A hand hole aperture is cut in a sidewall panel of the carton opposed the pouring notch. A bottle retaining insert is pressed into the carton and located in position by the shoulder of the bottle below the finish of the bottle. The insert may be held in place by retaining panels, which overlie the insert, formed in the carton sidewall. The insert may have a plurality of upwardly extending flaps which serve to form a reservoir for any of the bottle contents which may be spilled. In this case, one of the flaps would be slotted in alignment with the pouring notch, and another flap would have a hand hole aperture in registry with the hand hole aperture in the carton. In operation, a person may transfer the contents of the bottle by lifting the carton at the hand hole aperture and pouring through the notch. Thus, the hand of the person need never touch the bottle.

## 3,819,037
## CABLE PLUGGING APPARATUS

Manuel Filreis, Edina, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 28, 1972, Ser. No. 283,913
Int. Cl. B65d 79/00
U.S. Cl. 206—222 2 Claims



Sheathed electrical cables are plugged using a split sleeve sealed hermetically over an opened cable section and having

an access nipple for inserting hardenable liquid from a disposable container serving as a pressure applicator.

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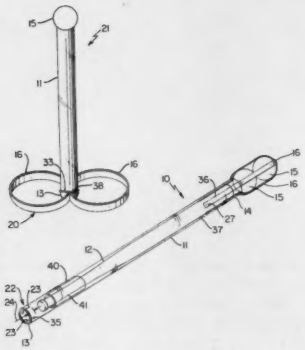
**3,819,038**
**PACKAGE CONSTRUCTION FOR BASEBALL TEE, BAT AND BALL**

**James T. Candor, 5440 Cynthia Ln., Washington Twp., Montgomery County, Ohio 45429, and Joseph V. Tassone, 2425 Rawndale Rd., Kettering, Ohio 45440**

**Filed Jan. 2, 1973, Ser. No. 320,206**
**Int. Cl. A63b** *69/40*
**U.S. Cl. 206—46 AM** **3 Claims**



A package construction which comprises a tubular ball tee, a ball bat telescopically received in the ball tee, a ball and a pair of straps for releasably retaining the ball at one end of the tee. The straps are further utilizable as a base structure for holding the tubular tee in a vertical position such that the ball may be placed on the upper end of the upstanding tee, the bat being used by a player to hit the ball from the tee.

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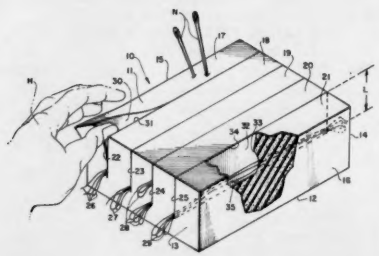
**3,819,039**
**SUTURE HOLDER**

**Oscar A. Erickson, 1620 Robbins St., Santa Barbara, Calif. 93101**

**Filed Mar. 4, 1971, Ser. No. 120,902**
**Int. Cl. A61l** *17/02*; **B65h** *55/00*; **B65d** *85/00*
**U.S. Cl. 206—388** **8 Claims**

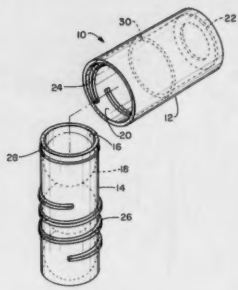


A block of resilient material has a series of parallel slits defining abutments which bear against surgical sutures positioned in the slits to hold them securely and conveniently in place.

**3,819,040**
**PRESSURIZED STORAGE CONTAINER**

**Gex B. Coons, 5641 Colfax Ave., No. 137, Arleta, Calif. 91601**

**Filed Sept. 14, 1972, Ser. No. 289,087**
**Int. Cl. B65d** *41/04*, *53/00*, *85/00*
**U.S. Cl. 206—1 R** **7 Claims**



A container for holding contents under air pressure wherein the container basically comprises abody and a cap, a threaded connection being established between the cap and the body, upon initial location of the cap upon the body an air-tight seal is established therebetween, as the cap is tightened upon the body air pressure is caused to increase within the container.

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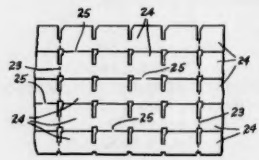
**3,819,041**
**ROLL OF SEPARABLE PARTITION STRIPS**

**Donald F. Cunningham, Mequon, Wis., assignor to Cleveland Partition Corp., Milwaukee, Wis.**

**Division of Ser. No. 45,187, June 10, 1970, abandoned. This application Jan. 26, 1973, Ser. No. 327,084**
**Int. Cl. B65d** *85/67*
**U.S. Cl. 206—390** **2 Claims**



This is a novel method of and apparatus for applying protective partitions between advancing glass containers, and the like, as they are moved towards a loading area, as in the disclosed end loading. The method includes providing, as by rerolled rolls of die cut ribbons of longitudinal partition strips, and directing advancing multiple continuous parallel ribbons of disconnectible longitudinal partition strips between advancing massed glass containers, successively placing transverse partition strips across the advancing longitudinal partition strips and between advancing ranks of glass containers which serve as yokes moved by the containers to pull the longitudinal strips, and successively disconnecting the end rank of longitudinal partition strips and packaging the end group of protectively partitioned glass containers in successively provided cartons, or otherwise packaging the same. The apparatus includes a conveyor for advancing glass containers, a rerolled roll of die cut ribbons of longitudinal partition strips, guide corridors and a ramp structure for feeding continuous ribbons of longitudinal partition strips between advancing massed glass containers, mechanism for applying transverse partition strips across the advancing longitudinal partition strips, and mechanism, as a ram, for successively packaging the end group of partitioned containers in cartons. Novel rerolled die

cut continuous longitudinal partition strip material and continuous partition assemblies are included.

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3,819,042

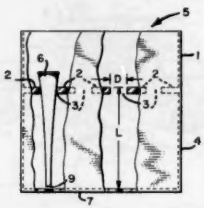
## ARTICLE POSITIONING DEVICE

Ronald B. Smernoff, Belmont, Calif., assignor to Analytical Products, Inc., Belmont, Calif.

Continuation of Ser. No. 143,814, May 17, 1971. This application Dec. 22, 1972, Ser. No. 317,768

Int. Cl. B65d *85/20*

U.S. Cl. 206—443 3 Claims



A device for positioning elongated articles having differing cross-sectional areas at different positions along their lengths is disclosed. An open top box-like housing is supported above a horizontal base. The bottom of the open top box-like housing consists of a plurality of substantially parallel, non-contiguous article support members defining a plurality of slots of substantially equal widths. The bottom of the open top box-like housing is elevated above the horizontal base in an orientation which is substantially parallel to the horizontal base by an elevation means such as legs or an integral continuation of the box-like housing. The device is utilized by introducing at least one article into the open top box-like housing and agitating the housing until at least one article falls into the slots. If the articles are disposable tips for pipettes they can readily be picked up by insertion of the pipette into the upwardly pointing opening of the tips.

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3,819,043

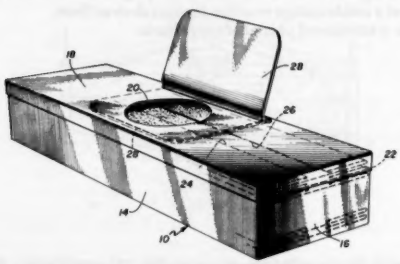
## DISPENSER PACK FOR PRE-MOISTENED TOWELETTES

Thomas S. Harrison, New Canaan, Conn., assignor to Sterling Drug Inc., New York, N.Y.

Filed Oct. 10, 1972, Ser. No. 295,814

Int. Cl. B65d *85/00*

U.S. Cl. 206—449 18 Claims



Dispenser pack for edge-folded pre-moistened tissues or towelettes, comprising a tray, a removable cover having an access opening, and a flexible re-sealable closure flap larger than and covering the opening preventing the contents from drying out but being easily pushed back by the finger to allow the finger access to the top-most tissue or towelette by catching an edge thereof. The flap is of a material tending to maintain its planarity and thus automatically recloses when released.

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3,819,044

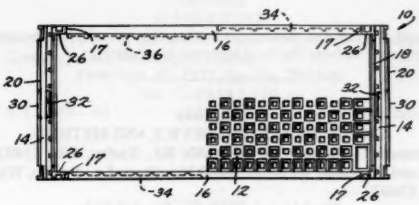
## CONTAINER COOPERABLE WITH A LIKE CONTAINER IN AN EMPTY NESTING RELATION AND A PLURALITY OF ARTICLE CONTAINING STACKING RELATIONS

Kenneth R. Bockenstette, Cincinnati, Ohio, assignor to Vanguard Industries, Inc., Cincinnati, Ohio

Filed Oct. 29, 1971, Ser. No. 193,808

Int. Cl. B65d *21/04, 1/22;* A47f *3/14*

U.S. Cl. 206—507 6 Claims



A container of unitary structure molded of plastic material including a foraminous horizontal wall, a pair of end walls and a pair of side walls, the end and side walls being integrally connected with the periphery of the horizontal wall and extending vertically therefrom. The container is operable to be disposed in a plurality of different vertically stacked relations with containers of like or similar construction and to be disposed in nested relation with respect to a plurality of like or similar containers. The stacked relationships include two cooperating functional relationships, one in which the container, disposed in a first article-containing position with the end and side walls extending upwardly from the horizontal wall, is mounted in stacked relation on a like container therebelow disposed in the first position thereof so that the horizontal wall of the container structure serves as a top closure for the container therebelow defining a container space having a vertical height generally equal to the height of the end walls and a second in which the container, disposed in a second closure defining position with the end and side walls extending downwardly from the horizontal wall, is mounted on a like container in vertically stacked relation therebelow disposed in the first position thereof so that the walls of the container structure serve as a top closure for the like container therebelow defining a container space having a vertical dimension substantially double that of the vertical dimension of the first mentioned container space.

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3,819,045

## FECAL EXAMINATION DEVICE

Robert J. Greenwald, 4771 N. Federal Hwy., Pompano Beach, Fla. 33064

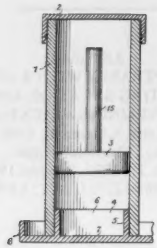
Continuation-in-part of Ser. No. 150,357, June 7, 1971. This application May 22, 1972, Ser. No. 255,857

Int. Cl. B03b *7/00*

U.S. Cl. 209—17 17 Claims

A fecal examining device comprising a closure member in the form of a tray adapted to be fitted upon the open lower end of a solution-receiving receptacle or cylinder, said closure member or tray including a central, open-top cup that extends into the cylinder for a short, predetermined distance. A cap is

provided for closing the open top of the cup or well when the tray is not attached to the cylinder. A perforated piston is provided for manual movement within the cylinder to thereby separate ova from the fecal material in solution.



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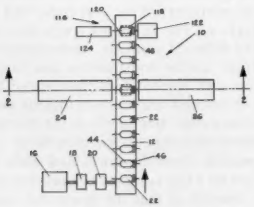
## 3,819,046
## ARMATURE TESTING DEVICE AND METHOD

**Kenneth G. Klema, 2209 4½ Mile Rd., Racine, Wis. 53402, and Raymond W. Beffel, 4400 Woodbury Ln., Racine, Wis. 53403**

**Filed Apr. 4, 1973, Ser. No. 347,861**
**Int. Cl. B07c**
**U.S. Cl. 209—74 M** **16 Claims**



A device and method for testing armatures automatically. The device includes an indexing conveyor, cradle means for moving the armatures therefrom to a center position, first and second armature shaft-gripping assemblies aligned on either side of the center position and being constructed to insert the armatures into a test station with required care and in a required orientation, a reject means, and suitable control and sequencing means. The method includes various armature moving and testing steps contemplated to rapidly test armatures with attention to the physical condition of the workpieces.

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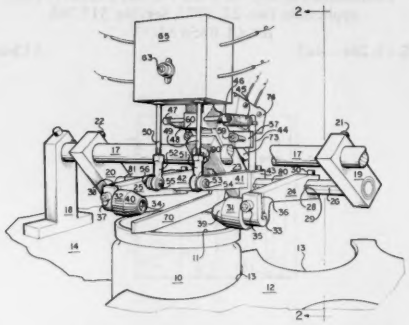
## 3,819,047
## BOTTLE GAUGING APPARATUS AND METHOD

**Thomas B. Sorbie, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio**

**Filed June 5, 1973, Ser. No. 367,127**
**Int. Cl. B07c** *5/08*
**U.S. Cl. 209—80** **13 Claims**

Apparatus for gauging the upper rim surface of a glass container for height as well as a symmetrical defect known as "warp." A warp gauge is disclosed in which a container is rotated about its vertical axis in a predetermined location. A pair of differential transformers are connected in series adding relationship having their armatures connecting contact members engageable with diametrically opposed points on the container rim. An output signal is produced proportional to the height difference of the contact members and a reject is provided when this signal exceeds a predetermined value. A pair of tapered guide members are added to engage the rim of the container as it is moved into position. These guide members are located alongside the contact members and raise the contact members just to the height of contact with the rim of the container, preventing damage to the container and to the guide members as the container is moved into inspection alignment. In addition, a separate rim sensing arm is provided to sense the presence of the rim of the container, being engaged by the rim of the container as it is moved into inspection alignment. A height measuring circuit is activated when a container is sensed in inspection alignment.



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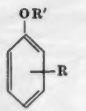
## 3,819,048
## OXIDE COPPER ORE FLOTATION USING CONDENSATION REACTION PRODUCT AS FLOTATION REAGENT

**Dean R. Weimer, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.**

**Filed Sept. 1, 1972, Ser. No. 285,800**
**Int. Cl. B03b** *1/02*
**U.S. Cl. 209—166** **6 Claims**

In a flotation separation process wherein oxide copper ores in subdivided form are concentrated by slurrying raw ores containing oxide copper ores in an aqueous solution of a flotation reagent followed by generating gas bubbles in the slurry to float the oxide copper ores and recovering the concentrated oxide copper ores from the surface of the slurry, the improvement therein which comprises employing as the flotation reagent a condensation reaction product derived from

A. a substituted phenol of the formula



wherein R is an alkyl group having 8 to 12 carbon atoms and R′ is H or a $(CH_2CH_2O)_xH$ radical where $x$ is an integer of 1 to 3,

B. an alkylene polyamine of the formula

$$H(HN\text{–}9\,CH_2CH_2)_yNH_2$$

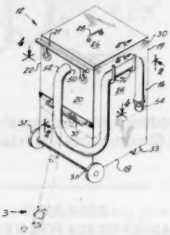
wherein $y$ is an integer of 2 to 6, and

C. formaldehyde.

## 3,819,049
## BALL RETRIEVING APPARATUS

Frances Koerner, 4040 N. 36 Ave., Hollywood, Fla. 33021, and Joseph Szuch, 25 Habersham St., North Miami Beach, Fla. 31313

Filed Feb. 5, 1973, Ser. No. 329,665
Int. Cl. B60p *1/60*
U.S. Cl. 209—250 8 Claims

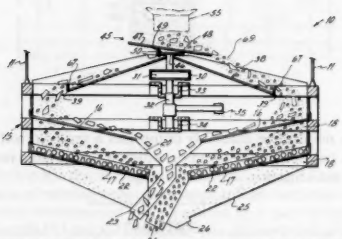


A ball or spherical object retrieving apparatus comprising a receptacle having a base provided with wheels, a storage chamber for balls to be picked up by suction through the mouth at the end of a hose connecting into the chamber, a screen floor for the chamber and a drawer below the chamber to collect debris from the collected balls and a suction or vacuum creating means in the receptacle, for use of the apparatus in picking up tennis balls, for example.

## 3,819,050
## FEED DISTRIBUTOR FOR SCREENING MACHINE

William Lower, Cincinnati, Ohio, assignor to The Orville Simpson Company, Cincinnati, Ohio

Filed Dec. 8, 1972, Ser. No. 313,544
Int. Cl. B07b *1/46*
U.S. Cl. 209—254 8 Claims



A distributor for directing an incoming feed stream uniformly to the different screen areas of a screening machine. The stream falls on a rotating, canted thrower which throws or slings the material outwardly along a rotating circular path, so that it falls between vanes on a roof over the screen. The vanes are angulated to direct the material over the edge of the roof, so that it falls at substantially uniform rates to different areas of the screen below.

## 3,819,051
## PROCESS FOR TREATING WASTES CONTAINING CHROMATES AND/OR COMPLEX IRON CYANIDES

Thomas D. Henley, Broomall, and Richard F. Reeves, Roslyn, both of Pa., assignors to Amchem Products, Inc., Ambler, Pa.

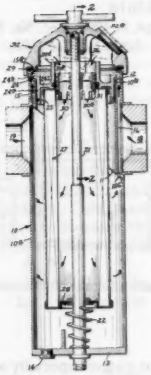
Filed Aug. 31, 1972, Ser. No. 285,190
Int. Cl. C02c *5/02*
U.S. Cl. 210—50 9 Claims

Dissolved hexavalent chromium and dissolved complex iron cyanide $[Fe(CN)_6]$ are removed from a liquid waste effluent by adding thereto a reducing agent having an anion capable of reducing said hexavalent chromium to trivalent chromium and a cation which forms a solid or precipitate with said complex iron cyanide. The preferred reducing agent is zinc hydrosulfite ($ZnS_2O_4$).

## 3,819,052
## FLUID FILTER

Robert L. Firth, Minneapolis, Minn., assignor to Donaldson Company, Inc., Minneapolis, Minn.

Filed Sept. 15, 1972, Ser. No. 289,646
Int. Cl. B01d *27/10*
U.S. Cl. 210—90 14 Claims



A first cylindrical filter housing having an open top is at least partially surrounded by a second housing forming a passageway therebetween. A baffle with a central opening is mounted in the open top and a cylindrical filter element is yieldably biased against the baffle member in the first housing. A dome-shaped cover is attached on top of the second housing to provide a flow path for fluid flowing from the passageway to the central opening in the baffle member into the filter element for passage through the filter element and then through an opening in the second housing. A combination bypass-indicator member is attached to the top of the movable filter element for guided sliding movements in the central opening of the baffle member.

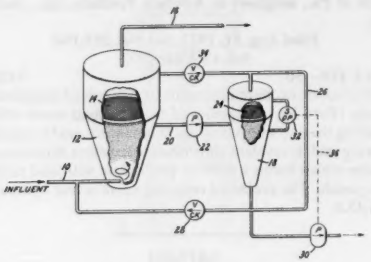
## 3,819,053
## WASTE TREATMENT SYSTEM

Francis J. Milotich, Broomall, Pa., assignor to General Electric Company, New York, N.Y.

Filed Oct. 2, 1972, Ser. No. 294,028
Int. Cl. B01d *21/26, 29/04*
U.S. Cl. 210—108 4 Claims

Sewage which has been ground, macerated, and treated with a coagulant is introduced at the bottom of a solids separating tank. Solids accumulate in a sludge blanket below a

screen dividing the tank into upper and lower portions, while clear liquid passes through the blanket and screen. Sludge from the sludge blanket is pumped to a sludge concentrating tank where further liquid is extracted. The concentrated sludge is periodically pumped out for incineration or other disposal.

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**3,819,054**

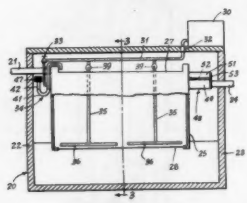
**SEWAGE TREATMENT SYSTEM**

**Hubert G. Long, and Veron E. Long, both of P.O. Box 180X, Rt. 1, Festus, Mo. 63010**

**Filed Sept. 8, 1971, Ser. No. 178,635**

**Int. Cl. C02c *1/02***

**U.S. Cl. 210—195** **9 Claims**



A sewage treatment system especially adapted to be a conversion unit for existing septic tanks, comprising an inner tank to receive raw sewage, the inner tank being within the septic tank and spaced from the walls thereof with its upper surface open above the liquid line; with an air diffuser system delivering compressed air within the inner tank just above a slot along its bottom to aerate and circulate the influent sewage delivered into the inner tank, and also to draw activated solid portions settling from the clarifier zone in the outer tank toward the sludge zone at the bottom thereof, through the slot in the inner tank into the aeration zone therein for further aeration treatment, with a final V-notched weir discharge means attached to the outer wall of the inner tank, with or without a chlorinator, and finally with a float skimmer means that insures the return of floating solids from the clarifier zone to the interior of the inner tank for retreatment.

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**3,819,055**

**FILTER CUP CONSTRUCTION**

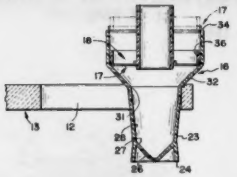
**James R. Skinner, Cupertino, Calif., assignor to M. U. Engineering & Mfg., Inc., Mountain View, Calif.**

**Filed Sept. 20, 1973, Ser. No. 398,958**

**Int. Cl. B01d *27/04***

**U.S. Cl. 210—232** **7 Claims**

Filter cup construction having a cup-like member, the cup-like member having a stem-like cup portion and a funnel-like portion adjoining the stem-like cup portion. The funnel-like portion is adapted to receive a filter member. The filter retaining member is frictionally retained within the funnel-like member and engages the filter member so that a liquid such as blood can be introduced into the funnel-like member and filtered through the filter member and retained within the stem-like cup portion.



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**3,819,056**

**MEMBRANE ASSEMBLIES FOR REVERSE OSMOSIS APPARATUS**

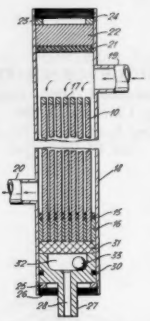
**Ian Donald Aitken, Sidcot; Ronald Gayler, Wantage; John Roger Grover, Reading, and Raymond Anthony Philip Spencer, Abingdon, all of England, assignors to United Kingdom Atomic Energy Authority, London, England**

**Continuation of Ser. No. 105,423, Jan. 11, 1971, abandoned. This application Oct. 10, 1972, Ser. No. 295,944**

**Claims priority, application Great Britain, Jan. 14, 1970, 1904/70**

**Int. Cl. B01d *31/00***

**U.S. Cl. 210—321** **8 Claims**



The membrane assembly comprises a grooved rod covered with a permeable sheath upon which is deposited a reverse osmosis membrane.

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**3,819,057**

**LOADING STATION STRUCTURE FOR TRAY FORMING MACHINE**

**Carl P. Cato, Lynchburg, Va., assignor to Dacam Corporation, Lynchburg, Va.**

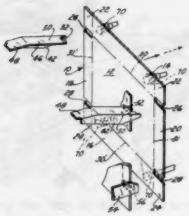
**Division of Ser. No. 815,474, April 11, 1969, Pat. No. 3,638,537. This application Feb. 17, 1971, Ser. No. 116,277**

**Int. Cl. A47f *7/00***

**U.S. Cl. 211—50** **3 Claims**

A box-forming machine has a loading station at which a stack of blanks is stored, the blanks being provided with slots

and the loading station structure including a rail which extends into those slots and supports the blanks in a substantially



vertical orientation, with means being provided to retain the blanks in position but permit them to be moved one at a time from the loading station.

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**3,819,058**

## DEVICE FOR THE ARRANGEMENT AND MOUNTING OF TOOLS

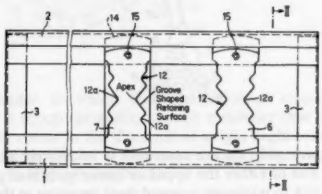
**Anton Reis, Erlen, Switzerland, assignor to Lienhard AG, Erlen, Switzerland**

**Filed Apr. 18, 1972, Ser. No. 245,117**

**Claims priority, application Switzerland, Apr. 21, 1971, 5823/71**

**Int. Cl. B25h** *3/04*; **A47b** *45/00*

**U.S. Cl. 211—60 T** **9 Claims**




In a device for the arrangement and mounting of tools and other parts of varying sizes and shapes at least two cross members extend between and are supported by a pair of laterally spaced parallel U-shaped channels. The channels are arranged so that the openings formed by the U-shaped sections are directed toward one another. Rounded ends are formed on the cross members and these ends fit into the U-shaped channels. The cross members can be displaced along the channels and, when positioned, can be secured against displacement by means of set screws and the like. The lateral surfaces of the cross members, extending transversely between the channels, are shaped to afford holding surfaces for securing the tools and other parts between a pair of the lateral surfaces on adjacent cross members.

**3,819,059**

## FOLDABLE CRANES

**Robert Mantel, Johannesburg, South Africa, assignor to Mantel Brothers (Proprietary) Limited, Honeydew, South Africa**

**Filed Dec. 26, 1972, Ser. No. 318,656**

**Claims priority, application Germany, Sept. 29, 1972, 2247839; South Africa, Jan. 19, 1972, 72/369**

**Int. Cl. B66c** *23/54*

**U.S. Cl. 212—35 R** **9 Claims**

A crane comprising a foldable jib hinged to the upper end of a post which is in turn pivotally connected at its lower end to a rotatable base. Both the jib and the post are arranged to be angularly displaced by means of a common piston and cylinder assembly.

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**3,819,060**

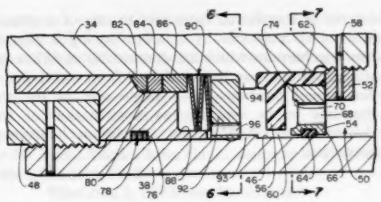
## DAMPING APPARATUS

**Giles A. Kendall, Burbank, Calif., and William D. Wallace, Chicago, Ill., assignors to Menasco Manufacturing Co., Burbank, Calif. and Miner Enterprises, Inc., Chicago, Ill., part interest to each**

**Filed Aug. 17, 1973, Ser. No. 389,433**

**Int. Cl. B61g** *9/08*

**U.S. Cl. 213—43** **14 Claims**



The cushioning assembly of this invention has an elongated housing with one closed end wall and a cylindrical passageway extending lengthwise from the closed end wall. A damped spring cartridge unit is slidingly mounted within the cylindrical passageway with its piston in an abutting engagement with the closed end wall. The other end of the damped spring unit projects outwardly of the housing and is in abutting engagement with a force transfer member extending crosswise to the axis of the housing. The damping apparatus of this invention is included within the damped spring cartridge unit. The damping apparatus employs the use of a piston head assembly which comprises a fixed annular disc with a gap or space located between the periphery of the fixed annular disc and the wall of the damping chamber. The fixed member includes an axial ex-

tension upon which is slidably mounted a movable member. The movable member is slidable between the damping position and a return position. With the movable member in contact with the fixed member (damping position) the gap is closed preventing movement of the damping medium from one side of the piston head to the other side of the piston head. Upon the damping force reaching a predetermined level, the fixed member is tiltable thereby causing the fixed member to be displaced thereby permitting the damping medium to be conducted through said gap.

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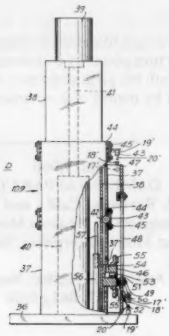
**3,819,061**

## APPARATUS FOR TRANSFERRING MATERIAL FROM AND TO PREDETERMINED POSITIONS

**Emil Johan Wilgott Andersson, Hagersten; Sven Algot Grondahl, Farsta; Nils Anders Rydahl, Hagersten, and Tom Eric Osterholm, Handen, all of Sweden, assignors to Aktiebolaget Electrolux, Stockholm, Sweden**

**Filed Feb. 7, 1972, Ser. No. 223,895**
**Claims priority, application Sweden, Feb. 12, 1971, 1805/71**
**Int. Cl. B25j** *9/00*
**U.S. Cl. 214—1 BB** **5 Claims**



Material is transferred from and to one of a plurality of predetermined positions by a robot having a plurality of transfer mechanisms which are connectible in different combinations. Material can be transferred from and to one of the predetermined positions by a single one of the transfer mechanisms or by one of any combination of transfer mechanisms in which at least two transfer mechanisms are interconnected.

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**3,819,062**

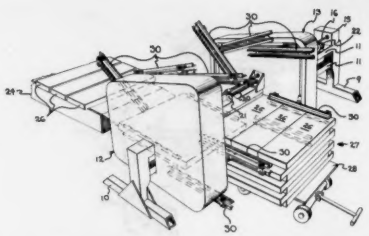
## CORRUGATED BOARD BUNDLE STACKER

**Frank J. Di Frank, Toledo, Ohio, and Daniel L. Greiwe, Chicago, Ill., assignors to Owens-Illinois, Inc., Toledo, Ohio**

**Division of Ser. No. 205,016, Dec. 6, 1971, Pat. No. 3,770,144.**
**This application Apr. 24, 1973, Ser. No. 354,020**
**Int. Cl. B65g** *47/24*
**U.S. Cl. 214—1 Q** **2 Claims**

Apparatus for receiving single or multiple bundles of corrugated board blanks from a corrugator in which the bundles are automatically picked up and in the preferred embodiment stacked on a cart, with alternate bundles being placed upside down with respect to the orientation of their delivery to the mechanism.

The disclosed mechanism is capable of handling full, corrugator width, single bundles of board or a plurality of less wide bundles at one time, thus obviating the necessity of having ex-



tremely high speed handling equipment or large off-bearer crews to handle the production from a corrugator. The bundles themselves, when stacked on the cart or truck, are placed in striated form for ease of unloading at another position.

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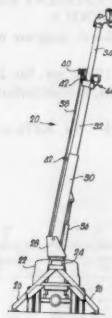
**3,819,063**

## CONVERTIBLE SHEAVE ASSEMBLY FOR TELESCOPING DERRICKS

**James J. Reimbold, Jr., Overland Park, Kans., assignor to A. B. Chance Company, Centralia, Mo.**

**Filed Sept. 22, 1972, Ser. No. 291,380**
**Int. Cl. A01g** *23/02*
**U.S. Cl. 214—3** **22 Claims**



A convertible sheave assembly is selectively securable to the tip end of either the upper or lower section of a telescoping derrick to minimize exposed steel structure at the tip of the derrick for safer working conditions. Workman buckets, as well as remote control levers, are selectively securable to the tip end of either the lower or upper boom sections to add flexibility and safety in electrical utility line work. A second sheave is pivotally secured to the tip end of the upper section to selectively retract inside the upper section when not in use.

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**3,819,064**

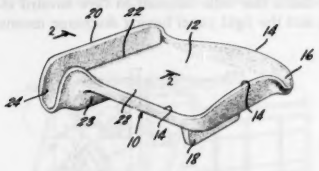
## PILL TRAY

**Susan Chandler, 150 E. 56th St., New York, N.Y. 10022**

**Filed Dec. 7, 1972, Ser. No. 312,807**
**Int. Cl. G07d** *9/06*
**U.S. Cl. 214—1 C** **9 Claims**

A pill tray has a rectangular base having a depressed trough formed on one side and a retaining wall formed on the other sides thereof. Both the wall and the trough have pour spout openings formed therein at opposite ends of the base. The

base slopes upwardly toward the trough. Pills are placed on the base and the desired number of pills are separated and pushed into the trough. The remaining pills on the base are



removed by tilting the tray downwardly toward the opening in the wall and pouring the pills into a container or bottle. Then, the desired number of pills are removed by tilting the tray downwardly toward and opening in the trough.

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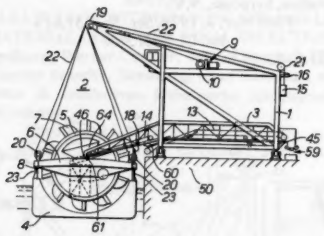
**3,819,065**
**VESSEL UNLOADER**

**Michishige Tomizawa, Tokyo, and Hirobumi Akizuki, Yokohama, both of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo-to, Japan**

**Continuation of Ser. No. 43,472, June 4, 1970, abandoned. This application Sept. 7, 1972, Ser. No. 287,208**
**Claims priority, application Japan, June 7, 1969, 44-52823; June 21, 1969, 44-58731; June 21, 1969, 44-58732**
**Int. Cl. B65g** *63/00*
**U.S. Cl. 214—14** **7 Claims**



An unloader in which from an unloader structure is suspended a scoop apparatus in such a manner that the apparatus may rotate in the direction at a right angle relative to the longitudinal axis of a bulk material carrying vessel and move along said longitudinal axis.

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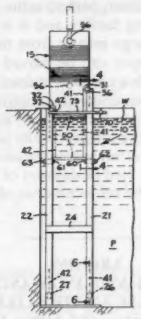
**3,819,066**
**APPARATUS FOR LOWERING AND RAISING A SHIPPING CASK FOR SPENT NUCLEAR FUEL INTO A STORAGE POOL**

**Cecil R. Jones, Hamden, Conn., assignor to Transfer Systems Incorporated, New Haven, Conn.**

**Continuation-in-part of Ser. No. 124,228, March 15, 1971, abandoned. This application Sept. 13, 1971, Ser. No. 179,713**
**Int. Cl. B65g** *1/04;* **G21c** *19/32*
**U.S. Cl. 214—16 B** **12 Claims**

Apparatus and method for lowering and raising a shipping cask into a storage pool for receiving spent nuclear fuel assemblies is described. The apparatus comprises a secondary support system installed in the pool for vertical movement of the cask in the pool. The secondary support system is capable of fully supporting the cask in case of failure of the usual overhead hoist system. A feature provides for lowering and raising of the cask in at least two steps, enabling addition of an extension piece to the overhead crane hook after the cask has been at least partly immersed to avoid immersion of the crane hook,



sheaves and cable into the storage pool. Still another feature is provision of a substantially water-tight removable shroud for the cask preventing direct contact of the cask exterior with the storage pool fluid to avoid contamination thereof.

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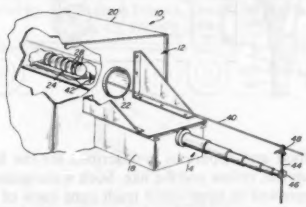
**3,819,067**
**HEAT TREATING APPARATUS**

**Ivan K. Hammond, Kinnelon Rd., Kinnelon, N.J. 07405**

**Filed Aug. 29, 1972, Ser. No. 284,648**
**Int. Cl. F27b** *9/00*
**U.S. Cl. 214—26** **9 Claims**



An apparatus is provided for heat treating semi-conductor elements in a diffusion furnace in which an interface is formed between the apparatus and the interior heat treating chamber of the furnace.

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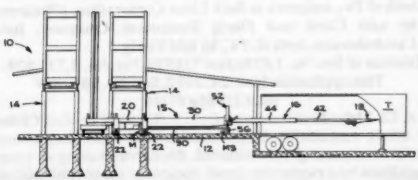
**3,819,068**
**BOOM CONVEYOR**

**Stanley M. Weir, Santa Clara, Calif., assignor to FMC Corporation, San Jose, Calif.**

**Filed Jan. 2, 1973, Ser. No. 320,367**
**Int. Cl. B65g** *67/02*
**U.S. Cl. 214—38 C** **9 Claims**



A boom conveyor including a longitudinally adjustable belt conveyor arranged to be adjusted for inclination relative to a

loading dock area and provided with an angularly adjustable conveyor ramp at its distal end which can be inserted within a cargo container in order to facilitate the transfer of goods to or from the container. The boom conveyor is positioned between the cargo container, parked at the edge of the loading dock area, and a staging facility and it is utilized for either loading or unloading cargo into or from the cargo container. The entire boom conveyor can be moved laterally along the dock into alignment with a cargo container, and the combined movements of the boom conveyor components provide for mechanized loading of goods to or from the cargo container. Elevational control of the longitudinally adjustable belt conveyor, and the structural arrangement of the latter with the conveyor ramp to allow feed or delivery of articles at substantially floor level forms the subject matter of the present invention.

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**3,819,069**

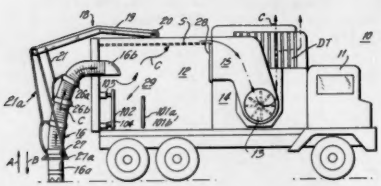
**APPARATUS FOR HANDLING WASTE MATERIAL, REFUSE AND THE LIKE**

**Joseph F. Bauman, Trenton, and Arthur M. Elson, Hamilton Township, Mercer County, both of N.J., assignors to Acme-Hamilton Manufacturing Corporation, Trenton, N.J.**

**Division of Ser. No. 121,865, March 8, 1971, Pat. No. 3,688,802. This application Sept. 5, 1972, Ser. No. 286,573**

**Int. Cl. B60p** *1/60*

**U.S. Cl. 214—41** **3 Claims**



A method and apparatus is described for the handling of waste material, refuse and the like. Such waste material is normally deposited in large sized trash cans each of which are provided with an opening located near the closed bottom end thereof. A mobile unit is provided with suction generating means coupled to a flexible elongated hose of relatively large diameter. The flexible elongated hose, preferably of a corrugated type, has an outwardly directed flange spaced inwardly from its free end and adapted to be seated upon the upper circular edge of a trash can with the marginal portion of the free end of the hose protruding slightly into the interior of the can. Energization of the suction generating means enables the contents of the refuse container to be easily and rapidly removed.

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**3,819,070**

**BULK MATERIAL HANDLING SYSTEM**

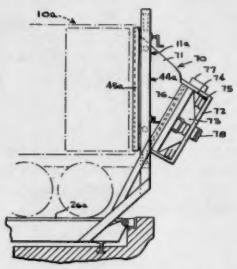
**Edwin E. Clarke, Allentown, and Albert J. Florig, Norristown, both of Pa., assignors to Bulk Liner Corporation, Allentown, by said Clark and Florig Equipment Company, Inc., Conshohocken, both of, Pa., by said Florig**

**Division of Ser. No. 1,078, Jan. 7, 1970, Pat. No. 3,731,828. This application Mar. 21, 1972, Ser. No. 236,604**

**Int. Cl. B65g** *67/40*

**U.S. Cl. 214—49** **3 Claims**

A bulk material handling system generally including a carrier for transporting bulk material, the carrier having an opening closed by a rupturable panel, means for supporting the carrier, means for tilting the support means to cause the bulk material within the carrier to gravity flow toward the closed opening when the carrier is positioned on the support means, a rigid upright frame structure mounted on the support means, a rigid panel mounted on the upright frame structure, movable into engagement with the rupturable panel when the carrier is positioned on the support means, for supporting the weight of the bulk material within the carrier when the support means is tilted to cause the bulk material to flow toward the closed opening, and the rigid panel having discharge means through



which bulk material within the carrier may be conveyed and discharged when the rigid panel engages the rupturable panel on the carrier, a portion of the rupturable panel is ruptured to intercommunicate the interior of the carrier and the interior of the discharge means and the support means is tilted to cause the bulk material within the carrier to gravity flow towards the closed opening and into the discharge means.

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**3,819,071**

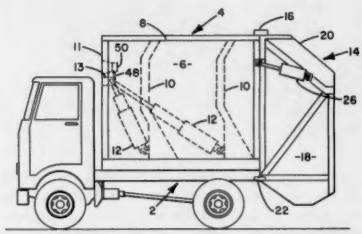
**REFUSE COLLECTION VEHICLE PACKING HEAD**

**Harvey W. Liberman, Knoxville, Tenn., assignor to Carrier Corporation, Syracuse, N.Y.**

**Filed Mar. 2, 1973, Ser. No. 337,619**

**Int. Cl. B65f** *3/00*

**U.S. Cl. 214—83.3** **7 Claims**



A refuse compaction system in a refuse collection vehicle having a movable plate inside the vehicle body against which refuse may be compacted; a hydraulic ram to hold and move the plate, and a variable valve having means to regulate the fluid pressure in the ram according to the position of the plate in the vehicle body.

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**3,819,072**

**FLOOR CONVEYOR APPARATUS FOR FORAGE WAGON**

**Edward A. Reed, Galion, Ohio, assignor to Harsco Corporation, Camp Hill, Pa.**

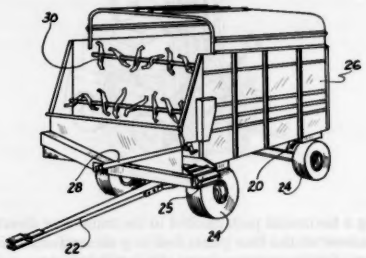
**Filed Mar. 23, 1973, Ser. No. 344,338**

**Int. Cl. B60p** *1/36*

**U.S. Cl. 214—83.36** **4 Claims**

A forage wagon for dispensing forage of the type wherein the floor of the wagon supports an endless conveyor that functions to move the material to the discharge end of the wagon

bed. The present invention relates to a novel floor and conveyor construction wherein the frame for the floor and conveyor is of unitary free-span construction that spans the body from side to side without the need for intermediate supporting structure. The floor frame further includes longitudinally extending chain receiving channels through which the conveyor




chains travel with said chains being supported in non-contacting relationship with respect to the walls of the channels. The machine is further characterized by an adjustable conveyor chain take-up means that will not interfere with passing flights, and which includes a conveyor flight construction that provides for self-cleaning of the flight supporting links of the conveyor.

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**3,819,073**

**APPARATUS FOR WITHDRAWING STRAND-LIKE MATERIAL IN LONGITUDINAL DIRECTION**

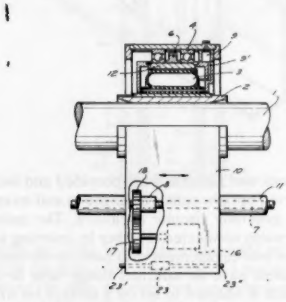
**Peter Asselborn; Werner Cramer, both of Bergisch Gladbach, and Guenter Schmitz, Altenberg, all of Germany, assignors to Felten & Guilleaume Kabelwerke Aktiengesellschaft, Koln, Germany**

**Filed Jan. 24, 1973, Ser. No. 326,296**

**Claims priority, application Germany, Jan. 26, 1972, 2203474**

**Int. Cl. B65h** *51/00*

**U.S. Cl. 214—338** **10 Claims**



Apparatus for withdrawing strand-like material in longitudinal direction, especially tubes and conductors for high frequency cables, in which at least two spaced gripping means coaxially surround the material movable in axial direction toward and away from each other and respectively grip the material during movement in the direction of withdrawal of the material and release the material during movement in the opposite direction.

**3,819,074**

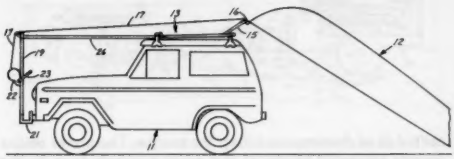
**BOAT LOADING APPARATUS**

**Clifford S. Oliver, 233 Fawn St., Golden, Colo. 80401**

**Filed Sept. 13, 1972, Ser. No. 288,598**

**Int. Cl. B65g** *67/02*

**U.S. Cl. 214—450** **17 Claims**



In boat loading apparatus for use on a vehicle there is provided an adjustable boat carrier rack to support the boat on the vehicle, a cable and cable guide arrangement including a swing arm movable to hold the boat away from the vehicle while a cable attached to the boat is being drawn over the free end of the swing arm, the swing arm being adjustably movable relative to the rack to accommodate different vehicles and a hoist for pulling the cable with one continuous winding of a winch at the end of the vehicle opposite the loading end.

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**3,819,075**

**DEVICE FOR LOADING A SKIP ON TO A VEHICLE**

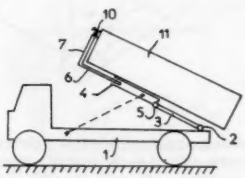
**Christian Derain, Saint Aubin Le Vieil Evreux, France, assignor to Societe Nouvelle des Bennes Saphem, La Neuve-Lyre, Eure, France**

**Continuation-in-part of Ser. No. 180,761, Sept. 15, 1971, abandoned. This application July 19, 1973, Ser. No. 380,814**

**Claims priority, application France, Oct. 1, 1970, 70.35574**

**Int. Cl. B60p** *1/28*

**U.S. Cl. 214—505** **6 Claims**



The device comprises a false chassis articulated about a first transverse axis at the rear part of the vehicle chassis and slidably supporting a L-shaped member which in turn supports a container. Said false chassis also comprises an articulation about a second transverse axis. Both slide and false chassis are moved by means of respective jacks. Rotation of the whole of said false chassis about said first axis provides a tipping wagon while sliding actuation of L-shaped member followed by rotation of the articulated portion of said false chassis about said second axis allows said container to be loaded or unloaded from said vehicle.

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**3,819,076**

**SPECIAL PALLET TYPE LOAD TRANSPORT APPARATUS**

**Carl W. Oehler, 2309 S.E. 11th St., Ocala, Fla. 33670**

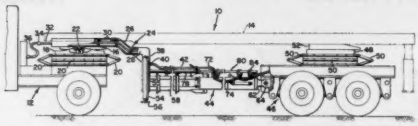
**Filed Oct. 20, 1971, Ser. No. 190,723**

**Int. Cl. B60p** *1/64*

**U.S. Cl. 214—512** **4 Claims**

A combination tractor-trailer and for use with a pallet load carrying assembly is provided. The trailer and tractor fifth wheel both have vertically movable, controllable, load support

or lift means associated therewith and the trailer is of improved, sturdy design to facilitate connection of power means to the trailer lift means, whereby the trailer can readily be connected to or disconnected from the tractor. The power means include protected electrical and pressure supply lines on the trailer at its front end. The trailer and supply lines are of variable effective length.



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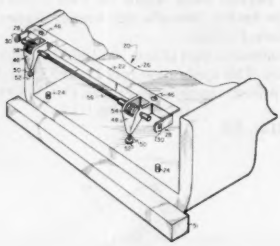
**3,819,077**

**CAMPER LOADING AND SECURING SYSTEM**

**Reed Rasmussen, 168 W. Gentile, Layton, Utah 84041, and Carl M. Rasmussen, 197 E. 1400 South, Bountiful, Utah 84010**

**Filed Nov. 13, 1972, Ser. No. 305,755**
**Int. Cl. B60p** *1/64*
**U.S. Cl. 214—516** **2 Claims**



A camper loading apparatus wherein a direct drive pinion assembly releasably affixed to the rear of a transportable bed engages corresponding racks on a camping unit. The pinion assembly becomes locked to both the transportable bed and the camper when the camper is fully loaded onto the bed. Each of the loading pinions may be selectively rotated individually or in unison to accomplish the loading operation. The invention provides supporting structure for the camper while remaining detachable thereby allowing the transportable bed to be used for other purposes without cumbersome or interfering structure.

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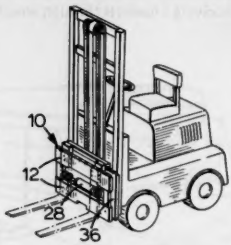
**3,819,078**

**SIDE SHIFTER UNITS FOR FORKLIFT TRUCKS**

**Francis J. Walsh, Oakville, Ontario, Canada, assignor to Erectoweld Company, Limited, Oakville, Ontario, Canada**

**Filed Jan. 17, 1973, Ser. No. 324,336**
**Claims priority, application Canada, Mar. 2, 1972, 136020**
**Int. Cl. B66f** *9/14*
**U.S. Cl. 214—730** **4 Claims**

A side shifter unit for a forklift truck according to the present invention includes the improvement of horizontal thrust bearing means which includes at least one pair of roller members each having a cylindrical bearing surface bearing directly against the base plate and the face plate. The thrust bearing means also includes means for retaining the rollers in a spaced parallel relationship with their axes of rotation extending at right angles to the direction of transverse movement of the face plate and guide means for guiding the rollers along a horizontal path parallel to the transverse direction of movement of the face plate, and stop means for limiting the extent of transverse movement of the roller means.

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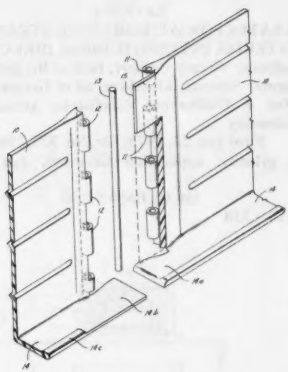
**3,819,079**

**PORTABLE TANK AND SHELL**

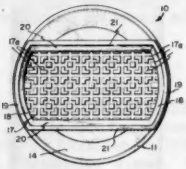
**Freer T. Levens, 2011 Winfield Rd., Midland, Tex. 79701**

**Filed Aug. 2, 1972, Ser. No. 277,302**
**Int. Cl. E04h** *3/18*; **B65d** *7/02*
**U.S. Cl. 220—5 A** **5 Claims**



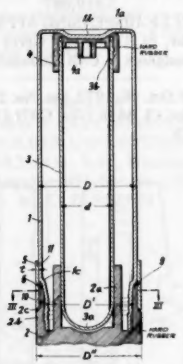
A portable tank and tank shell are provided and includes a plurality of curved upright panels arranged in end-to-end relation to form a generally circular enclosure. The ends of the panels are releasably connected together by inserting an interlocking member into engagement with parts on the ends of the panels. The panels have an inturned flange near or at their lower edge which is adapted to set on a surface on which the tank is to be erected. This flange serves to hold the configuration of the panels in a rigid curve and the weight of the liquid in the tank acts downwardly on the flange to help hold the panels in place and to generally strengthen the structure. Also, the flange at one end of a panel overlaps the flange on an adjacent panel to facilitate making the connection between the panels. The tank shell thus provided can be lined with a plastic flexible sheet liner. Preferably one end of each panel is provided with a lip which overlies the joint between the panels to maintain the liner out of contact with the joint.

3,819,080
CARRYING CONTAINER
Stanford W. Bird, Salt Lake City, Utah, assignor to Plastronics Corporation, Salt Lake City, Utah
Filed Jan. 3, 1972, Ser. No. 214,555
Int. Cl. B65d *25/02, 1/22*
U.S. Cl. 220—17 2 Claims



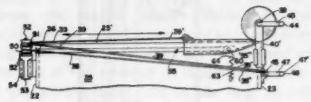
A container providing a bucket, a basket insert and a lid such that separated hot foods can be packaged therein and can be individually vented.

3,819,081
MAILER FOR BIOLOGICAL SAMPLES
Herbert Runte, Hannover, Germany, assignor to Aug. Harre & Co., Hannover-Linden, Germany
Filed Mar. 9, 1972, Ser. No. 233,164
Claims priority, application Germany, Mar. 12, 1971, 7109321
Int. Cl. B65d *3/04, 3/24*
U.S. Cl. 220—17 5 Claims



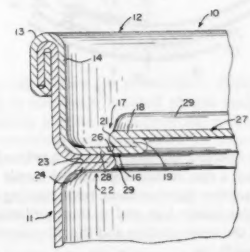
A sample-receiving inner tube is threaded into an inner cap provided in the base of an outer tube of a mailer for biological samples and the like. Another cap is screwed over the mouth of this outer tube, with this latter cap being provided with a seat for the closed end of the inner tube. An addressed and stamped (postage previously applied) sealing strip with a longitudinal perforation is applied over the joint line between the outer tube and its cap with the perforations in line with this joint line. The outer cap is stepped so that the sealing strip does not project above its surface and to form a shoulder spaced from the junction or parting line by the width of a portion of the tape as measured to the perforations to ensure proper positioning of the strip.

3,819,082
TRUCK BOX COVER DEVICE
Leo Rosenvold, Wildrose, N. Dak.
Filed Jan. 28, 1972, Ser. No. 221,595
Int. Cl. B65d *43/00*
U.S. Cl. 220—24 R 2 Claims



The invention comprises a grain box cover device. The grain box cover device has a roller mounted along one side of the upper edge of a grain box. A sheet canvas is rolled onto the roller. A pair of rods are mounted below the upper edge of the box and have their one ends pivotally mounted to the other side of the box and extending toward the roller. The rods have their other ends terminating adjacent and beneath a lower portion of the roll of canvas. The canvas has flexible channels along its outer side edges which receive the outer end of the rods. Rope and pulling means are provided for pulling the front outer edge of the canvas across the top of the grain box in a direction toward the pivotal mounting of the rods, with the channel portions of the canvas sliding along the rods. The rods act to hold the outer side edges of the canvas below the upper edge of the box for effective closing of the box.

3,819,083
SAFETY EDGE EASY OPENING CONTAINER
Albert J. Holk, Jr., Frankfort, Ill., assignor to Continental Can Company, Inc., New York, N.Y.
Filed July 17, 1972, Ser. No. 272,589
Int. Cl. B65d *17/20*
U.S. Cl. 220—54 3 Claims

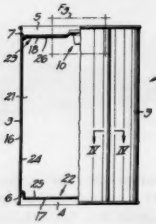


An easy opening container of the full opening type having a score line defining a removable panel portion and in which a first folded panel is provided in the end panel and a second folded panel is provided in the container body. The first folded panel has a folded edge protecting the severed edge on the removable panel after separation. The second fold band provides a protective edge for the severed edge remaining on the container body.

3,819,084
METALLIC PACKAGES FOR THE DISTRIBUTION OF BEER UNDER PRESSURE
Jean Morjan, Koekelberg-Brussels, Belgium, assignor to Etablissements J. B. Gabriels S.P.R.L., Brussels, Belgium
Filed July 11, 1972, Ser. No. 270,768
Claims priority, application Belgium, June 15, 1972, 51974
Int. Cl. B65d *25/14, 25/34*
U.S. Cl. 220—64 4 Claims

This invention relates to a process for the manufacture of a metallic highly resistant package constituted by a very thin

cylindrical body covered with a polymerizing epoxy-phenolic layer; by upper and lower faces of very small thickness formed out of niobium containing steel sheets and covered with a solution of polymerized polyvinyl chloride hydrocarbon ketone, said faces having a central opening the peripheral



edge of which is raised with respect to the general plane of said faces; on the area near the welding line the packing has a layer of a solution of polyvinyl chloride ketone and, finally, the package has over all its inner faces a layer of a solution of polymerized polyvinyl chloride hydrocarbon ketone.

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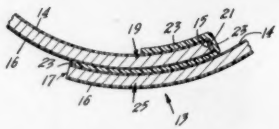
**3,819,085**

## LAP SIDE SEAM OF METAL, TUBULAR BODY AND METHOD FOR MAKING SAME

**Stanley Edward Rohowetz, Barrington, Ill., assignor to American Can Company, Greenwich, Conn.**

**Filed Mar. 28, 1972, Ser. No. 238,840**
**Int. Cl. B65d 7/34**
**U.S. Cl. 220—75** **2 Claims**



An adhesively bonded, lap side seam of a primed metal, tubular body having a raw metal edge on the inside lap is provided with a protective thermoplastic resin coating on the raw metal edge of the inside lap and a thermoplastic adhesive wrapped around the resin coating and the interior and exterior surfaces of the inside lap.

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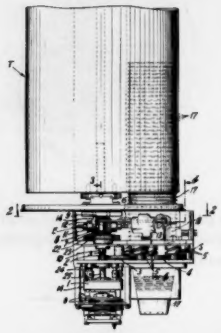
**3,819,086**

## DEVICE FOR ROTATING THE CUP-HOLDER TURRET OF AN AUTOMATIC DISPENSER

**Canzio Paolucci, 47, Via Copernico, 20159 Milano, Italy**

**Filed Mar. 14, 1973, Ser. No. 341,151**
**Claims priority, application Italy, Mar. 18, 1972, 22065/72**
**Int. Cl. G07f 11/12**
**U.S. Cl. 221—11** **5 Claims**

The turret is rotatable about a vertical axis and contains a plurality of angularly spaced stacks of cups. The device includes a planetary gearing having a pair of first bevel gears secured to respective substantially vertical coaxial shafts, one driven by a geared motor and the other mounting the turret. The planetary gearing further includes a pair of second bevel gears meshing with the first bevel gears and secured to a substantially horizontal shaft having ends projecting beyond the second bevel gears. An oscillatable eccentric has a projection oscillatable therewith and movable into the path of movement of the projecting ends of the substantially horizontal shaft. This eccentric, responsive to the presence of a stack of cups at a dispensing sump, is restrained to a position in which its projection is out of the path of movement and, when no cups are present at the sump, is released to move its projection into the path of movement of the projecting ends of the substantially horizontal shaft to prevent rotation thereof about the axis of the substantially vertical shafts. Normally, with the projection in its retracted position, the first bevel gear driven by the motor effects idling rotation of the second bevel gears and the



horizontal shaft about the axis of the vertical shafts, so that the turret is not rotated. When the projection prevents movement of the horizontal shaft, the first bevel gear secured to the turret shaft is rotated to rotate the turret to position a fresh stack of cups in registry with the dispensing sump. A detent limits angular movement of the turret to a distance equal to the angular spacing between adjacent stacks of cups and, when no more cups are in the turret, a sensing switch opens the operating circuit for the motor and for the beverage dispenser.

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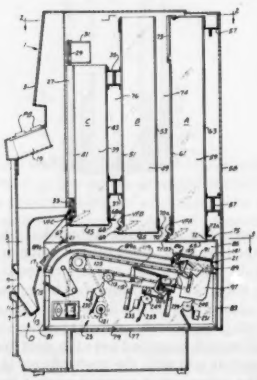
**3,819,087**

## ARTICLE-DISPENSING APPARATUS

**James T. Schuller, St. Louis, and Gerry A. Lee, Bridgeton, both of Mo., assignors to UMC Industries, Inc., New York N.Y.**

**Filed Oct. 10, 1972, Ser. No. 296,154**
**Int. Cl. B65h 3/44; G07f 11/10**
**U.S. Cl. 221—123** **16 Claims**



A vendor for packs of cigarettes comprising a plurality of banks of columns (e.g., three banks with twelve columns per bank), each column being adapted to hold a stack of packs to

be vended. The banks of columns are arranged to provide a plurality of side-by-side rows of columns (e.g., twelve rows). Each column is adapted for ejection of the lowermost pack of the stack in that column by a carriage movable underneath the banks carrying a plurality of ejectors, one (and only one) for each of the rows of columns. Each ejector is movable from a down position to an up position for ejection of the lowermost pack of the stack in a column of the respective row as the carriage moves through an ejecting stroke, means being provided for effecting movement of the ejector for the row in which the selected column is situated from its down to its up position prior to said ejector reaching the bank in which said selected column is situated.

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**3,819,088**

**SELECTIVE DISPENSING OF STORED ARTICLES**

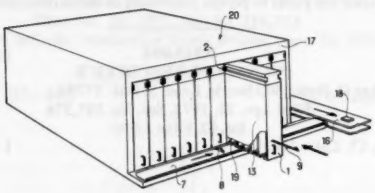
**Jean Guigan, 9 rue Jean Mermoz, Paris, France**

**Filed May 22, 1972, Ser. No. 255,475**

**Claims priority, application France, May 21, 1971, 71.18429**

**Int. Cl. B65h** *3/24*

**U.S. Cl. 221—224** **20 Claims**



Fixed modules carry a plurality of slides which, in turn, form a plurality of side-by-side storage compartments. The slides are selectively extracted along their longitudinal axis from the modules and an article is removed from a selected compartment by aligning the compartment with an evacuation device, which preferably passes through part of the compartment at right angles to remove the article.

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**3,819,089**

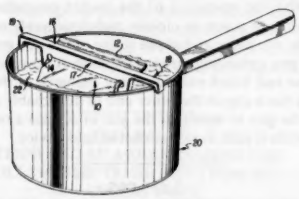
**FOOD STORAGE AND COOKING BAG AND ASSOCIATED HOLDER AND DISPENSING ELEMENT**

**John K. Scales, 1608 33rd St., N.W., Washington, D.C. 20007**

**Filed Aug. 11, 1971, Ser. No. 170,791**

**Int. Cl. B65d** *35/28*

**U.S. Cl. 222—95** **4 Claims**



A food storage and cooking bag of conventional lay-flat tubular construction is heat sealed at one end to form a handle, V-shaped notches being formed immediately adjacent the handle along the opposite longitudinal edges of the bag. A tearable seal is formed at the opposite end of the bag to permit vacuum sealing of the contents of the bag and subsequent tearing open of that end of the bag for ease of removal of the contents. A bag holding and dispensing element includes a central portion having an elongated slot through which the upper, or handle, end of the bag is inserted for assembling the bag with the element, and a pair of arms formed integrally with the central portion and extending outwardly therefrom. The arms engage the upper edges of the side walls of a cooking vessel containing boiling water into which the food containing portion of the bag is immersed, the element maintaining the handle portion of the bag accessible for ease of removal thereof from the vessel when cooking is completed. Thereafter, the tearable seal is removed to open the end of the bag, the bag then being grasped by the handle and withdrawn through the slot of the element or, equivalently, the element being slid toward the open end of the bag, to extrude, or dispense, the contents of the bag for serving.

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**3,819,090**

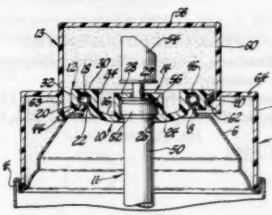
**AEROSOL VALVE CUP AND SAFETY COLLAR**

**Stewart Hector Birrell, Clarkson, Mississauga, Ontario, Canada, assignor to Reflex Corporation of Canada Limited, Windsor, Ontario, Canada**

**Filed May 12, 1972, Ser. No. 254,334**

**Int. Cl. B67d** *5/36*

**U.S. Cl. 222—182** **23 Claims**



A valve cup device for pressurized dispensing containers comprising a one-piece molded plastic body formed with a valve retaining portion for supporting a dispensing valve assembly, a container mounting collar for securing the body to a container, and a closure portion extending between the collar and valve retaining portion. The closure portion is of dished configuration such that axial pressure on the lower surface of the closure portion will produce a radially outward component of force at the juncture between the closure portion and collar to increase the pressure between the collar and the container. Safety cap adapting means is integrally formed on the body for engagement with a complementary safety cap to removably secure the safety cap to the body. The safety cap adapting means comprises a plurality of container locking elements of the type that are adapted to be engaged with and disengaged from complementary locking elements on a safety cap by an axial motion followed successively by a rotative motion, and resilient biasing means for biasing the safety cap locking elements toward locked engagement with the container locking elements.

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**3,819,091**

**SYRINGE APPLIANCE**

**Anders K. Y. Hollender, Boras, Sweden, assignor to Hugo Castenfors, Hoglidsvagen, Ennebyberg, Switzerland**

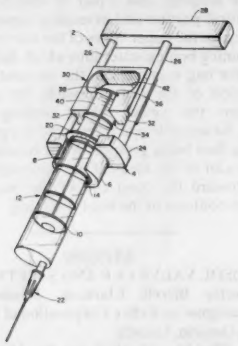
**Filed Apr. 16, 1973, Ser. No. 351,257**

**Int. Cl. A61m** *5/00*

**U.S. Cl. 222—327** **5 Claims**

A syringe appliance which is uniquely configured so as to enable the user thereof to manipulate the syringe with one

hand and wherein the syringe appliance can be used time and again with disposable syrings. The syringe appliance permits



positive injection or withdrawal of the inner or piston element of the syringe and is provided with a pistol-like grip to facilitate manipulation.

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**3,819,092**
**PRESSURIZED DISPENSERS**
**Angelo T. Bonduris, Cockeysville, Md., assignor to Colgate-Palmolive Company, New York, N.Y.**
**Continuation of Ser. No. 253,790, May 16, 1973. This application Aug. 7, 1973, Ser. No. 386,330**
**Int. Cl. B65d** *83/14*
**U.S. Cl. 222—389** **4 Claims**

An aerosol-type dispenser wherein the interior of the container is separated into isolated relatively fluid tight product and propellant compartments by a piston assembly comprising an upper relatively stiff shape retaining portion slidably mounted within the container and having on respective opposite sides substantially full area contact with the product and propellant and a depending flexible skirt anchored fluid tight within the lower interior of the container.

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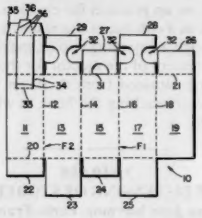
**3,819,093**
**SLIDE TOP DISPENSING CARTON**
**Hampton E. Forbes, Jr., Wilmington, Del., assignor to Westvaco Corporation, New York, N.Y.**
**Filed Nov. 7, 1972, Ser. No. 304,466**
**Int. Cl. B67d** *3/00*
**U.S. Cl. 222—529** **4 Claims**

The carton of the present invention is in the form of a dispensing carton having an integral slidable panel at the top thereof to permit the dispensing of the contents of the carton. The dispensing top of the carton is constructed from a novel combination of top closure flaps which, when manipulated in a preferred order, form the top closure of the carton, a dispensing opening for the carton, a captured slide panel for



covering and uncovering the dispensing opening of the carton, a completely siftproof closure for both the top of the carton and the hinged end of the slide top panel, a tamperproof initial closure for the carton, and a convenient means for gripping the slide top panel to permit dispensing of the carton.

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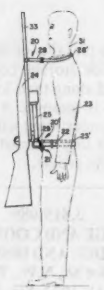
**3,819,094**
**GUN SCOPE REST DEVICE**
**LeRoy O. Hyde, 803 Searle, Lead, S. Dak. 57754**
**Filed Apr. 25, 1972, Ser. No. 247,376**
**Int. Cl. F41c** *33/00*
**U.S. Cl. 224—1 R** **1 Claim**



The invention comprises a scope rest device for a gun having a scope mounted thereon. The scope rest device has a socket adapted to be attached to the waist of an operator of the gun with the open end of the socket extending upward. The socket is of a size to closely and detachably receive and support the eye piece end of the scope of the gun with the barrel of the gun extending upward. A strap is provided having a loop at one end which extends about the neck of the operator and which has a clip at the other end to detachably engage the barrel of the gun to maintain the gun in at least a rear vertical position while it rests in said socket of said device.

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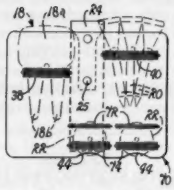
**3,819,095**
**DEVICE FOR RETAINING A GOLFER'S ACCOUTERMENTS**
**Ira D. Snyder, 613 S. Lucas Dr., Santa Maria, Calif. 93454**
**Filed Nov. 26, 1971, Ser. No. 202,112**
**Int. Cl. A45c** *11/00*
**U.S. Cl. 224—5 C** **4 Claims**

An improved device for securely retaining a golfer's accouterments in a readily accessible situs during a round of play. The device is characterized by a plate having a spring-biased

clip affixed to one surface for attaching the plate to the belt or waistband or clothing worn by a golfer, and a plurality of helical springs of a substantially cylindrical configuration mounted at the opposite surface of the plate for securely supporting ball markers, tees, a divot repair tool, and the like.



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**3,819,096**

## GLASS BREAKING

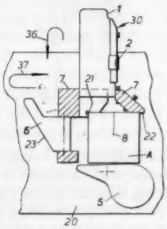
**Alan Smith Pyper, 6 Warkton Close, Chilwell, Nottinghamshire, England**

**Filed Nov. 30, 1972, Ser. No. 310,713**

**Claims priority, application Great Britain, Nov. 30, 1971, 55620/71**

**Int. Cl. C03b** *33/02*

**U.S. Cl. 225—96.5** **6 Claims**



Apparatus for producing clean breaks in glass for the manufacture of knives comprises a vice and a scoring device mounted on a common base board. The vice includes two protrusions on one jaw and a third protrusion on the other jaw formed by the tip of a screw which can be advanced and retracted at right angles to the jaws. Guide blocks on one of the jaw faces are provided to ensure that a score line on a square of glass to be broken coincides with the third protrusion. The scoring device includes guide faces to align glass to be scored for breakage so that the intended score line underlies a cutter mounted for linear movement on a flap which is pivotally attached to base board so that it may be swung clear to locate the glass on the base board in abutment with the guide faces.

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**3,819,097**

## METHOD AND AN ARRANGEMENT FOR CONTROLLING THE TENSIONING FORCE IN AN ADVANCING YARN

**Vilem Stritzko, Strengelbach, Switzerland, assignor to Bleiche AG, Zoffingen, Switzerland**

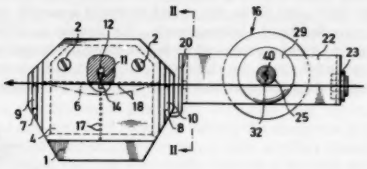
**Filed May 10, 1973, Ser. No. 359,029**

**Claims priority, application Switzerland, May 15, 1972, 7199/72**

**Int. Cl. B65h** *23/18*

**U.S. Cl. 226—39** **8 Claims**

An advancing yarn passes through yarn retardation means and pneumatic yarn tension sensing means. A stream of pressurized medium is directed against the yarn deflecting the same and suffering as a result of said deflection a pressure drop which is transmitted to actuation means which adjust the retardation force exerted by the retardation means upon the advancing yarn, so as to maintain the yarn tension on a preselected level. There are also provided means for automatic shut-off of the yarn advancing means in case of yarn breakage.



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**3,819,098**

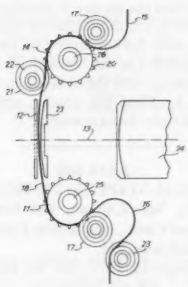
## FILM FORWARDING MECHANISM

**Arturo Castrejon Penaloza, Calzada Vicente Guerrero 19-A, Acapulco, Mexico; Jose Datshkovsky, deceased, late of Acapulco, Mexico, and by Raisa Bardach Datshkovsky, legal representative, Mexico City, Mexico**

**Continuation-in-part of Ser. No. 78,351, Oct. 6, 1970. This application Oct. 16, 1972, Ser. No. 297,906**

**Int. Cl. G03b** *1/24, 1/34*

**U.S. Cl. 226—85** **3 Claims**



A film forwarding mechanism for motion-picture projectors, cameras or the like, includes a lower sprocket driven by an intermittently rotatably shaft located below the aperture plate and under the optical axis, the teeth of which are coupled with side perforations of the film, and a second intermittently rotatable sprocket located above the aperture plate and the optical axis, and aligned with the lower intermittent sprocket. Pressure rollers maintain the film seated against each of the sprockets, and an eccentric guide roller smooths and curves the film onto a shoe rest.

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**3,819,099**

## STRAND THREADING DEVICE

**Herbert Henry Bierenfeld, Doraville, Ga., assignor to Western Electric Company, Incorporated, New York, N.Y.**

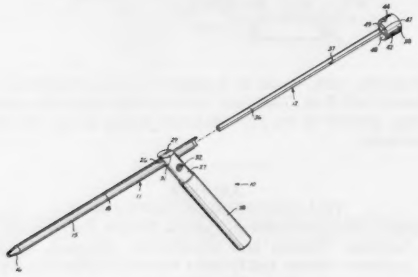
**Filed May 8, 1972, Ser. No. 251,336**

**Int. Cl. B65h** *57/12*

**U.S. Cl. 226—91** **22 Claims**

An elongated longitudinally slotted housing having a tapered end extends through a bifurcated end of a handle. The opening between the bifurcated portions of the handle are aligned with the slot in the housing. A knob having a groove formed therein is attached to an end of a longitudinally slotted tubular guide member mounted rotatably within the housing.

An operator grasps the handle, and turns the knob and the tubular member attached thereto to misalign the slot of the tubular member with the housing slot. Strand material is inserted through the knob and pushing forces are applied to move the strand material into the tubular member. Then the operator inserts the tapered end of the housing into an extruder head and feeds the strand material inwardly through the extruder head. Subsequently, the device is withdrawn along the strand material while maintaining the strand material threaded through the extruder head. The tubular member is turned to align the slots and the device moved laterally out of



confining engagement with the strand material prior to the operation of the extruder.

The tubular guide member may be replaced with a longitudinally grooved rod. The tapered end of the housing is modified to cooperate with an end of the rod to form a conically-shaped end when the groove is misaligned with the housing slot. At that time, the centerline of the conically shaped end is coincident with the centerline of the groove which is offset from the centerline of the housing. The conically shaped end is designed to mate with the walls of an opening in the extruder head and to align the groove and strand material therein with the extruder head opening.

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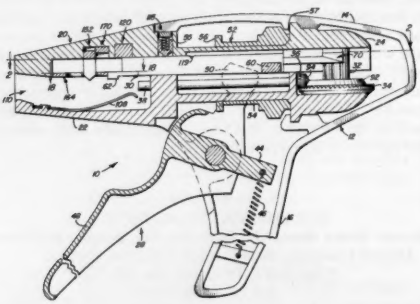
**3,819,100**

## SURGICAL STAPLING INSTRUMENT

**Douglas G. Noiles, New Canaan, and Graham W. Bryan, Ridgefield, both of Conn., assignors to United States Surgical Corporation, Baltimore, Md.**

**Filed Sept. 29, 1972, Ser. No. 293,470**
**Int. Cl. B25c** *5/02*
**U.S. Cl. 227—19** **22 Claims**



A surgical stapling instrument for applying sterilized staples to the disunited skin or fascia of a patient in order to effect a joining of the skin or fascia. The instrument is adapted to associate with a staple-carrying cartridge having a plurality of staples therein. The instrument is manually powered and includes a nose portion rotatably mounted in a hand-held main body portion and adapted to mount the staple-carrying cartridge so that the stapling angle can be varied without rotating the hand-held portion of the stapler. A clutch means is provided for ensuring that the staple-advancing drive means of the instrument is only activated once per stapling operation. The instrument is further provided with means for preventing the insertion of a fresh staple-carrying cartridge until the instrument is in the readiness position for a driving stroke, and means for maintaining the unloaded instrument in its readiness position until equipped with a cartridge.

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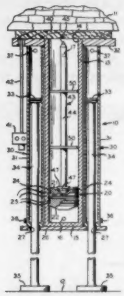
**3,819,101**

## APPARATUS FOR SETTING PINS IN MINE ROOFS

**Gerald W. Elders, Christopher; Thomas E. Schneider, and John R. Alongi, both of Duquoin, all of Ill., assignors to Lee-Norse Company, Charleroi, Pa.**

**Division of Ser. No. 846,795, Aug. 1, 1969. This application Nov. 26, 1971, Ser. No. 202,611**
**Int. Cl. B25c** *5/10*
**U.S. Cl. 227—130** **13 Claims**



A pin-setting device includes an elongate cylinder having an open end and a closed end in which a piston is movably mounted, the pin being located in the cylinder with the pin head seating on the piston. A pair of fluid jacks are located on opposite sides of and attached to the pin cylinder. A pressure plate is carried by the pin cylinder substantially near the open end, the pressure plate overlapping the jacks and engaging the mine roof to locate the open cylinder end in the predetermined area at which the pin is to be fixed, and holding the block against the mine roof. The jacks exert pressure on the mine roof through the pressure plate and block, and clamp the open end of the pin cylinder in such position. Upon introduction of fluid into the cylinder, the piston is moved in a direction to press the pin into the mine roof under a substantially smooth pushing force.

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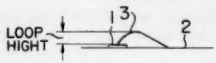
**3,819,102**

## LOOP HEIGHT ADJUSTING DEVICE FOR A SUPERSONIC WIRE BONDER

**Masahide Isobe, Hayamamachi, Japan, assignor to Tokyo Sokuhan Kabushiki Kaisha, Hayamamachi, Japan**

**Continuation of Ser. No. 141,208, May 7, 1971, abandoned. This application June 21, 1973, Ser. No. 371,964**
**Int. Cl. B23k** *5/20*
**U.S. Cl. 228—1** **1 Claim**




A loop height adjusting device for a supersonic wire bonder, which comprises a cam profile for the first search level and a

cam profile for adjusting a loop height fixed on separately disposed cams respectively to adjust the loop height irrespective to a presettled value of the first search level by choice of configuration of the cams, so that the adjustment of the loop height can be attained easily and optionally using an adjust screw, thus eliminating troublesome replacements of cams.

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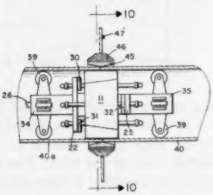
**3,819,103**

## EXPLOSIVE WELDING OF PIPE WITH EXPLOSIVE MEANS

**William G. Howell, Lakewood; Steve H. Carpenter, Littleton, and Henry E. Otto, Denver, all of Colo., assignors to Esso Research and Engineering Company**

**Filed May 12, 1972, Ser. No. 252,678**
**Int. Cl. B23k** *21/00*
**U.S. Cl. 228—3** **8 Claims**



A high explosive ring is detonated by placing in contact with the ring a sectional, connected, planar mounting member having a circular opening for receiving the ring of explosive and contacting the outer surface of the ring. Arranged on the mounting member, which may be formed of material destroyed on detonation of the explosive, are arcuate patterns of high explosive formed in a flower-like shape outwardly from the center of the ring at the base of petals of the flower-like shape at a multiplicity of peripherally spaced-apart points, the base and the petals having circular openings. Each petal may be provided with a detonator connected to an electrical source such that on energization of the detonators the strips explode and initiate simultaneously explosion of the ring at each point of contact.

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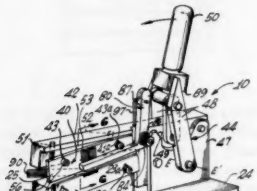
**3,819,104**

## APPARATUS FOR COMPRESSION AND COLDWELDING OF STRIPPED ENDS OF MULTI-CONDUCTOR CABLE

**Donald D. Lang, Garden Grove, Calif., assignor to Spectra-Strip Corporation, Garden Grove, Calif.**

**Filed Jan. 24, 1973, Ser. No. 326,286**
**Int. Cl. B23k** *21/00*
**U.S. Cl. 228—3** **25 Claims**



This disclosure is directed to a method and means for compression and coldwelding of stripped ends of flat, insulated, multi-conductor cable, the conductors of which are usually, but not always, composed of stranded, soft, annealed copper. The stripped or bared ends of the resulting cable are spaced apart within very close tolerances of the order of 1/100 of an inch. These close tolerances are obtained by first stripping a small area of the cable along a designated stripping line to bare a given area of conductors, then confining the bare conductors within grooves or channels of a first metal die shoe having predetermined center-to-center spacings, and compressing the conductors under pressure exerted by means of a second metal die shoe carrying teeth interfitting into, or slidably engaging with, each of the grooves occupied by the conductors. After compression and coldwelding of the conductors this disclosure provides a simplified, and automatic, method and means of precisely cutting the compressed ends. The stripped, compressed conductor ends are then fluxed and tinned so that they are very rigidly fixed in place with respect to each other, and can be much more readily interconnected to various types of precisely spaced termination points and other electrical interconnect assemblies.

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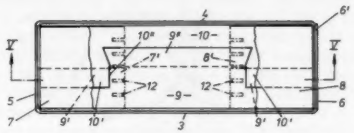
**3,819,105**

## FOLDING BOX

**Egon Heimann, Falkenberg 61, 56 Wuppertal-1, Germany**

**Filed Aug. 11, 1972, Ser. No. 280,003**
**Claims priority, application Germany, Feb. 26, 1972, 2209280**
**Int. Cl. B65d** *5/10*
**U.S. Cl. 229—39 R** **3 Claims**



Box formed from a folded blank, in particular for document filing. The box has a bottom, two side walls and at least one end side wall and has means for keeping the box erected, i.e. maintain the general shape of the box when folded for use and prevent its collapse. The box may have a bottom with, on the interior side, a pair of slotted flaps adapted to engage, within the box, a separator with a pair of lugs adapted to be engaged by a pair of slots. The box may have also an inwardly folded tab having laterally directed tongues retained between foldlines of the sidewalls and end side wall. The tab can be used for gripping below supporting rails.

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**3,819,106**

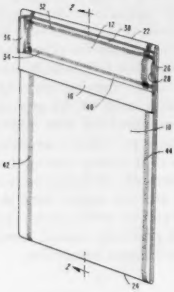
## SAMPLE BAG

**Samuel J. Schuster, 1099 Hillside St., Monterey Park, Calif. 91754**

**Filed Apr. 12, 1972, Ser. No. 243,347**
**Int. Cl. B65d** *33/20*
**U.S. Cl. 229—62** **15 Claims**

A pre-sterilizable sample bag is disclosed for receiving and storing a sample for analysis at a location remote from the situs of sample collection. The bag is fabricated of material essentially completely impermeable to bacteria and other foreign matter and includes an access opening covered by a removable closure membrane essentially completely impermeable to bacteria and other foreign matter but highly permeable, in comparison to said bag material, to sterilizing

vapor. The outer surface of the bag includes an adhesive coating adapted to be engaged in sealing contact with the area of



the bag material about the access opening to completely seal the opening after removal of the closure membrane and insertion of the sample into the bag.

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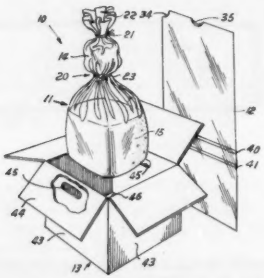
**3,819,107**
**PACKAGING APPARATUS AND METHOD**
**Richard E. Ryder, Jr., 901 Pinecrest, Richardson, Tex. 75080**
**Filed Oct. 8, 1970, Ser. No. 79,018**
**Int. Cl. B65d** *31/14*
**U.S. Cl. 229—62.5** **5 Claims**



Packaging apparatus and method for dust-free storage, shipping, mixing and dispensing dust-laden cement mixtures. Included is a waterproof bag having a neck portion provided with a dust check valve, a storage, shipping and dispensing box, and a water measuring bag. The bag is partially filled with cement; the dust valve is spaced substantially from the open end of the neck of the bag, and a storage and shipping seal is secured around the gathered neck of the bag. In the method of using the apparatus, water is measured in the water bag and dispensed through the neck of the cement bag through the dust valve into the cement in the bag. The water and cement are mixed in the bag, the bag is placed in the box, and the neck of the bag is spread over the edges of the box. The opened box-supported bag serves as a mud pail or bucket for the mixture.

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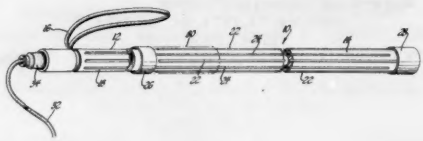
**3,819,108**
**CROWD CONTROL STICK**
**Richard James Jordan, Roseville, Mich., assignor to General Marine, Inc., Bloomfield Hills, Mich.**
**Filed Aug. 28, 1972, Ser. No. 284,019**
**Int. Cl. B68h** *1/00*
**U.S. Cl. 231—2 E** **19 Claims**

An electric shock weapon is disclosed for use by officers in maintaining order at public gatherings and for other crowd control applications. The invention is embodied in an electrified stick or in an electrified garment worn by the user. The device comprises at least one pair of exposed conductors which are connected across a high voltage power supply and adapted to be simultaneously engaged with the anatomy of a would-be assailant and thus to ward off or cause retreat of such person. In order to give warning of the character of the device, and to lend a menacing appearance, a sparking device is disposed on the weapon and connected across the high voltage power supply to provide a spark discharge. In the embodiment of the invention in an electrified stick a grip portion is



provided at the rear end and a slidable insulating sleeve is disposed over a portion of the conductors and movable to the forward end of the stick to provide an auxiliary gripping portion for two-handed use of the stick. The high voltage power supply preferably comprises a capacitor discharge system comprising a battery energized transistor inverter and a voltage doubler connected across a storage capacitor, with a self-switching discharge circuit connected with an induction coil which in turn is connected with the exposed conductors on the device. A timing circuit and a silicon controlled rectifier are employed in the self-switching discharge circuit.

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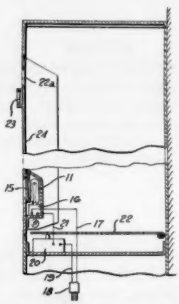
**3,819,109**
**MAILBOX ARRAY**
**Angelo Ucciardino, 2621 Stillwell Ave., Brooklyn, N.Y. 11223**
**Filed Nov. 21, 1972, Ser. No. 308,380**
**Int. Cl. B65d** *91/00*
**U.S. Cl. 232—24** **1 Claim**



A mailbox array is shown which includes a series of interconnected mailbox elements. Each of said series comprises a set of horizontally and vertically aligned mailboxes. Each of the mailboxes has a numeric designator thereupon. The first number of the designator refers to the row of the array in which the mailbox appears, the second number refers to the series of the array and the third number refers to the column of the array.

Each of the numeric designators is translucent and selectively actuatable illuminating means are disposed behind each of the designators. The illuminating means are selectively actuated by means of a trip plate within the mailbox which is movable by the impingement of mail therewithin.

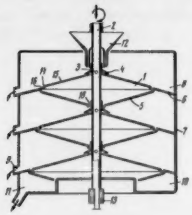
## 3,819,110
## METHOD FOR SUSPENSION SEPARATION AND APPARATUS FOR ACCOMPLISHING SAME

**Vladimir Ivanovich Baturov, ulitsa Uritskogo, 10a, kv. 49; Yakov Khaimovich Prilutsky, ulitsa Markovnikova, 22, kv. 3; Viktor Ivanovich Shiborin, ulitsa Novomoskovskaya, 26, kv. 34, all of Dzerzhinsk Gorkovskoi oblasti, and Dmitry Evseevich Shkoropad, korpus 3, kv. 82, Moscow, all of U.S.S.R.**

**Continuation of Ser. No. 155,551, June 22, 1971, abandoned. This application Jan. 15, 1973, Ser. No. 323,378**

**Int. Cl. B04b** *5/02*

**U.S. Cl. 233—17** **5 Claims**



A method for the separation of suspensions under the effect of centrifugal forces in a thin liquid film formed on the surface of a body of revolution there is initially fed a lubricating fluid onto said surface to produce on said surface a liquid coat, followed by delivering onto said lubricating fluid coat the suspension to be separated and subjecting said suspension to the effect of centrifugal forces. An apparatus for accomplishing said method is disclosed in which above the surface of each body of revolution there is disposed a guiding element mounted on a vertical shaft so as to form a clearance in relation to said surface, with said guiding element being intended to shape the film stream of the suspension to be separated on the surface of a lubricating fluid coat produced by the lubricating fluid fed through holes in the vertical shaft wall.

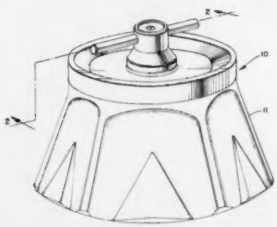
## 3,819,111
## CENTRIFUGE ROTOR COVER

**William A. Romanauskas, Southbury, and Charles Paulsen, Newtown, both of Conn., assignors to Ivan Sorvall, Inc., Norwalk, Conn.**

**Filed Apr. 9, 1973, Ser. No. 349,402**

**Int. Cl. B04b** *1/00*

**U.S. Cl. 233—27** **8 Claims**



There is disclosed a cover for a centrifuge rotor which is affixed thereto by being screwed onto the hub of the rotor. The cover is constructed in a manner to provide a depending skirt which seats against an upstanding rim of a rotor of a centrifuge. This cover is constructed to seat tighter under the centrifugal forces encountered whereby a portion of the skirt is urged outwardly and down against the seat on the rim. The cover is also designed to have an annular well for collecting small quantities of overflow fluid. The cover is also consructed with a means to preliminarily provide communication between the outside and inside the rotor of the centrifuge in order to establish equilibrium therebetween prior to removal of the cover.

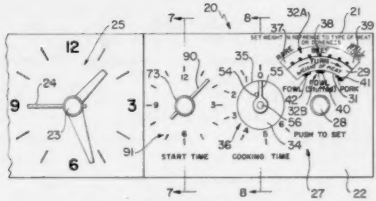
## 3,819,112
## COOKING COMPUTER MEANS

**Carl J. Goodhouse, Litchfield, Conn., assignor to Robertshaw Controls Company, Richmond, Va.**

**Filed Mar. 21, 1972, Ser. No. 236,753**

**Int. Cl. G01c** *1/00*

**U.S. Cl. 235—61 A** **10 Claims**




A cooking computer for determining the cooking operation of a cooking apparatus, the computer having a stationary input means indicating selectable variables other than the weight of the meat item and having a manually settable weight input means for indicating a single selected indicated weight applicable to all meat items and corresponding to the weight of a particular meat item to be cooked. The weight input means is settable in relation to a selected variable of the stationary input means. The computer has a time period output means operatively associated with the input means to provide as an output, a cooking time period for the particular meat item computed as a function from the selection of both of the input means according to a cooking formula. Both of the input means are so constructed and arranged that when utilized for computing of said cooking time period for a particular meat item, the input means continuously indicates the selected weight and variable for that meat item even after the operation of the time period output means for the computed cooking time period.

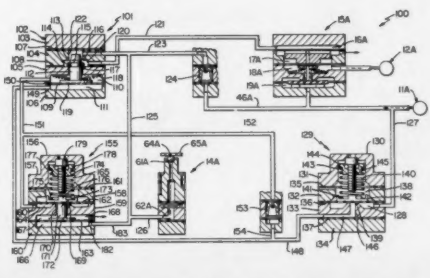
## 3,819,113
## FLUID CONTROL SYSTEM AND METHOD OF OPERATING THE SAME

**Louis M. Puster, Knoxville; Jay L. Lewis, and Harold G. Brakebill, both of Concord, all of Tenn., assignors to Robertshaw Controls Company, Richmond, Va.**

**Filed Nov. 20, 1972, Ser. No. 308,181**

**Int. Cl. G05d** *23/275*; **G05b** *11/50*

**U.S. Cl. 236—1 C** **10 Claims**



A fluid control system having a fluid supply means and a fluid operated device. A branch chamber of a fluid operated

relay is interconnected by a movable valve means with the exhaust chamber thereof or with the main chamber thereof in response to fluid conditions existing in the pilot chamber thereof. The fluid supply means is interconnected to the main chamber and to the pilot chamber. The fluid operated device is interconnected to the branch chamber. A condition responsive fluid bleed device is interconnected to the pilot chamber whereby the condition responsive fluid bleed device effectively bleeds the pilot chamber of the fluid being supplied thereto from the fluid supply means in response to conditions being sensed thereby so that the fluid being supplied the fluid operated device from the branch chamber is varied in relation to the conditions being sensed by the condition responsive fluid bleed device.

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**3,819,114**

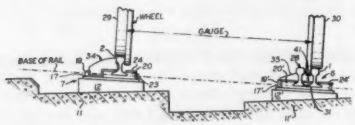
**RAILROAD TRACK ASSEMBLY**

**Charles J. Bush, Wood-Ridge, N.J., assignor to The New York City Transit Authority, Brooklyn, N.Y.**

**Filed May 17, 1972, Ser. No. 253,979**

**Int. Cl. E01b** *2/00*

**U.S. Cl. 238—121** **8 Claims**




A unique railroad track assembly having reduced maintenance cost is secured by a tie assembly which reduces noise and wear. The assembly comprises in combination a base channel member having vertical sides which supports a rail cushioning element supporting the rail. The base channel distributes the stresses to all holding elements thus preventing their breaking or bending. A unique feature is the use of elongated holes in certain elements so as to permit the movement of the rail in a lateral manner to adjust the gage. Shims are positioned between the rail supporting cushioning element and the vertical sides of the channel element.

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**3,819,115**

**ELECTROSTATIC SPRAY GUN**

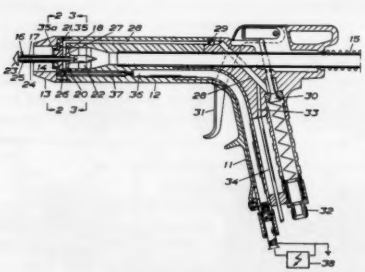
**Claes Erik Soderman, Skara, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden**

**Filed Mar. 12, 1973, Ser. No. 340,549**

**Claims priority, application Sweden, Mar. 13, 1972, 3197/72**

**Int. Cl. B05b** *5/02*

**U.S. Cl. 239—15** **17 Claims**



The powder spray gun comprises a handle, a barrel and a front member screwed to the barrel. The barrel and the front member form a duct through which paint powder is conveyed entrained in the air. An annular electrode and an elongated central body are clamped between the barrel and the front member and a lead for high voltage extends through an axial bore in the barrel and abuts axially against the annular electrode. The duct is annular and the electrode has an annular forward-directed edge that has a clearance to the walls of the duct and is located at a touch protecting distance from the mouth of the duct.

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**3,819,116**

**SWIRL PASSAGE FUEL INJECTION DEVICES**

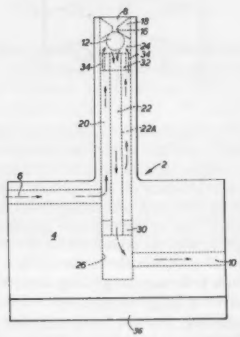
**Mark Wallinger Goodinge, Brentwood, and Robert Shephard, Brakingside, both of England, assignors to Plessey Handel Und Investments A.G., Zug, Switzerland**

**Filed May 29, 1973, Ser. No. 364,857**

**Claims priority, application Great Britain, July 26, 1972, 34848/72**

**Int. Cl. B05b** *17/06*

**U.S. Cl. 239—102** **5 Claims**



A fuel injection system having an ultrasonically vibrated nozzle to provide for fuel atomisation. The nozzle has a fuel outlet having a ball valve to give a quick fuel shut-off. Fuel circulates continuously around the ball valve by passing through passageways. The circulating fuel swirls around the ball valve and this swirling facilitates quick fuel atomisation when the nozzle is vibrated.

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**3,819,117**

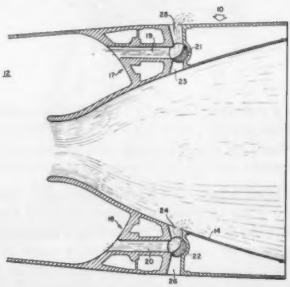
**THRUST VECTOR — JET INTERACTION VEHICLE CONTROL SYSTEM**

**Seth B. Moorhead, Jr., Orlando, Fla., assignor to Martin Marietta Corporation, New York, N.Y.**

**Filed May 25, 1970, Ser. No. 48,634**

**Int. Cl. B63h** *25/46*

**U.S. Cl. 239—265.23** **16 Claims**



A control system for a high speed rocket powered vehicle involving the use of a valve arrangement in which hot gases

are received from the motor, and selectively ported overboard or into the rocket nozzle in order to provide maneuvering or vectoring control for the vehicle. In a preferred embodiment, at least one pair of oppositely disposed valves is utilized, with the movable portions of the valves arranged to be relatedly movable such that the vectoring forces provided by the valves are additive. My valves have a neutral position in which no maneuvering forces are generated, with an inherent fail-safe design being involved such that catastrophic maneuvers are prevented in the event control power is lost. Also, inasmuch as my valves do not shut off the hot gas flow, the rocket motor chamber pressure desirably does not fluctuate. Advantageously, the valve construction taught herein can withstand the hot erosive gases emanating from a solid fuel rocket.

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**3,819,118**

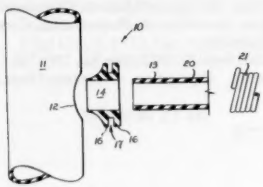
**DRIP IRRIGATION**

**Alan James Brock, 26 Strangeway Ter., North Adelaide, and Douglas William Fulton, 526 Grand Junction, Angle Park, both of Australia**

**Continuation of Ser. No. 70,786, Sept. 9, 1970, abandoned. This application Oct. 17, 1972, Ser. No. 298,230**

**Int. Cl. A62c** *31/22*

**U.S. Cl. 239—276** **16 Claims**



Drip irrigation means and method wherein capillary tubes are formed to a coil shape and are either wrapped around a plastic walled secondary distribution pipe or depend from it, the capillary tubes passing through apertures of smaller size in the secondary distribution pipe thereby to be retained by the resilient deformation of the pipe wall, thus enabling the secondary distribution pipe to be more readily handled and enabling any blocked capillary tube to be readily cleared.

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**3,819,119**

**SPRAYER FOR DECORATING SURFACES**

**Charles A. Coffey, and Michael J. Catena, both of Tampa, Fla., assignors to Harris Paint Company, Tampa, Fla.**

**Division of Ser. No. 221,033, Jan. 26, 1972, Pat. No. 3,764,067, which is a continuation-in-part of Ser. No. 44,590, June 8, 1970, abandoned. This application June 21, 1973, Ser. No. 372,033**

**Int. Cl. B05b** *7/32;* **B44d** *1/08;* **B65d** *83/14*

**U.S. Cl. 239—337** **6 Claims**

A glitter coating composition is applied from a manually-operated aerosol spray can by spraying a glitter coating composition comprising solid, highly reflectant, non-leafing polymer-coated metal flakes, a vehicle system therefor, and a propellant by the steps of (1) flowing the glitter coating composition through a passageway of substantially uniform cross-sectional area, (2) expanding the flowing glitter composition in an elongated expansion chamber, and (3) accelerating the expanded flowing glitter composition through a constricted orifice. The glitter coating issues from the orifice in the form of a finely-divided well-mixed spray.

**3,819,120**

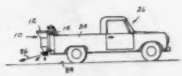
**DISTRIBUTOR SECURABLE TO A VEHICLE FOR THE PURPOSE OF SPREADING SALT, SAND OR SIMILAR PARTICULATE MATERIAL**

**Jerry Wayne Walker, Wabash, Ind., assignor to The Cyclone Seeder Company, Inc., Urbana, Ind.**

**Filed Feb. 12, 1973, Ser. No. 331,617**

**Int. Cl. A01c** *3/06, 7/00, 15/00*

**U.S. Cl. 239—661** **3 Claims**



A distributor for salt, sand, and other particulate material which is mountable on a vehicle, such as a truck, and which includes a hopper having a lower discharge opening. A frame which is securable to the vehicle supports the hopper for vertical shiftable movement relative to the frame and vehicle between upper and lower positions. An impeller is mounted below the discharge opening of the hopper and is powered by a motor which is housed within the hopper.

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**3,819,121**

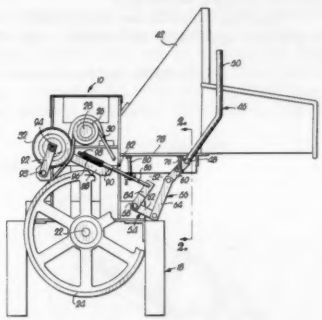
**WOOD AND BRUSH CHIPPER**

**Chester D. Rogers, Olathe, Kans., assignor to Olathe Manufacturing Company, Olathe, Kans.**

**Filed July 26, 1972, Ser. No. 275,343**

**Int. Cl. B02c** *23/04*

**U.S. Cl. 241—240** **4 Claims**



A safety control for wood and brush chippers, in the nature of a manually movable throw-out assembly, is operably coupled with a material-receiving platform such as to virtually eliminate the possibility of injury to workmen from the standpoint of being accidentally drawn into the machine through its housing inlet. The arrangement also permits controlled feeding so that relatively large pieces of material may be handled easily and quickly with a substantial saving in horsepower requirements.

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**3,819,122**

**APPARATUS FOR WINDING STRAND MATERIAL**

**Samuel Richard Genson, Weston, Ohio, assignor to Johns-Manville Corporation, Greenwood Village, Colo.**

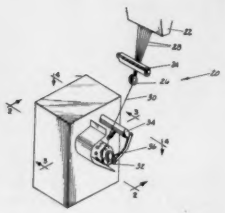
**Filed Sept. 28, 1972, Ser. No. 293,179**

**Int. Cl. B65h** *54/02*

**U.S. Cl. 242—18 R** **7 Claims**

A winding apparatus for forming a cylindrical package of a strand material comprises a stationary traverse assembly having a guide which reciprocates back and forth to guide the

strand material onto the package, a mandrel that is movable relative to the traverse assembly for receiving a tube on which the package is wound, a drive train for driving both the traverse assembly and the mandrel by means of a single drive



belt regardless of the relative positions of the traverse assembly and the mandrel, and a sensing device for sensing the diameter of the package and effecting movement of the mandrel in small increments away from the traverse assembly as the package builds.

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**3,819,123**

**WINDING APPARATUS**

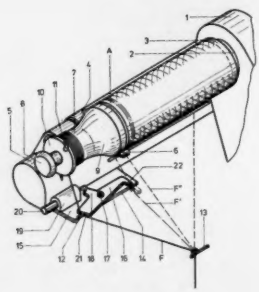
**Rudolf Luz, Horgen, Switzerland, assignor to Maschinenfabrik Schweiter AG, Horgen, Switzerland**

**Filed Dec. 18, 1972, Ser. No. 316,009**

**Claims priority, application Switzerland, Jan. 13, 1972, 449/72**

**Int. Cl. B65h** *54/34*

**U.S. Cl. 242—18 PW** **11 Claims**



To prevent winding of initial lengths of yarn on a pirn or a yarn spooling core, which initial lengths may be offsize with respect to specifications, an auxiliary thread starting element is located coaxially with the yarn spool core, and an auxiliary thread guiding element controllable by lengths or quality of the thread is located in alignment with the auxiliary thread starting element, to guide the thread first on the starting element and then release the thread to transfer, automatically, to the traverse mechanism to wind the thread on the spooling core. The additional thread starting element and the guide are located at an end of the yarn spool core and the lateral tension of the thread, upon release of the thread from the auxiliary guide, will automatically transfer the thread to the traverse mechanism.

**3,819,124**

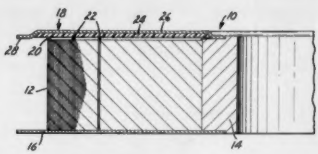
**CUSHION FLANGE REEL**

**Harlen L. Marks, Roseville, and Norman C. Ritter, Mounds View, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Filed June 23, 1971, Ser. No. 155,775**

**Int. Cl. B65h** *75/14, 75/18*

**U.S. Cl. 242—71.8** **11 Claims**



A reel for storing magnetic recording tape wound upon itself. At least one flange of the reel includes a layer of cushioning material on its inner surface which protects lengths of the tape projecting axially from the edge surface of a wound tape toward the flange when the flange impinges against the tape.

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**3,819,125**

**REEL FOR STRIP-SHAPED ARTICLES**

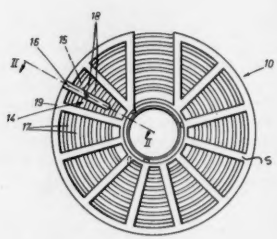
**Johannes Juergen Bockemuehl-Simon, Gummersbach, Germany, assignor to Johannes Bockemuehl, Gummersbach-Derschlag, Germany**

**Filed Sept. 7, 1972, Ser. No. 286,706**

**Claims priority, application Germany, Sept. 7, 1971, 7133967**

**Int. Cl. B65h** *9/00*

**U.S. Cl. 242—77.1** **10 Claims**



A pair of axially spaced flanges project radially from a hub and have facing inner sides provided with guide recesses which spirally surround the hub. A resiliently yieldable arm is provided on the outer circumferential marginal portion of at least one of the flanges and has a projection extending axially of the hub and which can be inserted into and withdrawn from the guide recess of the flange in question through a cut-out provided in the flange.

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**3,819,126**

**SEAT BELT RETRACTOR WITH GEAR WHEEL ACTUATED LOCKING MEANS**

**Robert W. Stoffel, Ferndale, Mich., assignor to International Engineering Service, Inc., Royal Oak, Mich.**

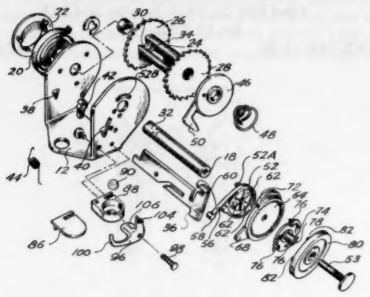
**Filed July 21, 1972, Ser. No. 273,968**

**Int. Cl. A62b** *35/02;* **B65h** *63/04*

**U.S. Cl. 242—107.4** **7 Claims**

A seat belt retractor having a first stop for disabling a reel-locking device as the belt is being unwound from a fully wound position, and a second stop for disabling the reel-

locking device until the belt is either rapidly unwound, or the vehicle in which the retractor is mounted is disposed in an ab-



normal position or experiences an abnormal motion. The user can either partially or fully unwind the belt from the reel on its initial unwinding motion without prelocking the reel.

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**3,819,127**

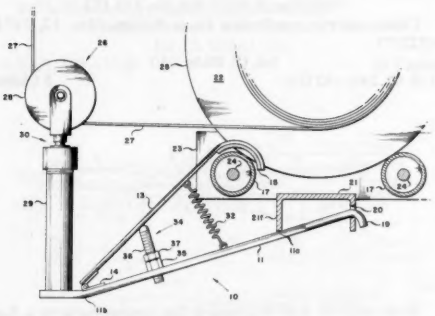
**BRAKING DEVICE**

**Frank Priestly, Northridge; Jack Coverley, and Raymond E. Shulda, both of Los Angeles, all of Calif., assignors to Lockheed Aircraft Corporation, Burbank, Calif.**

**Filed Oct. 2, 1972, Ser. No. 294,433**

**Int. Cl. B65h** *59/04*

**U.S. Cl. 242—156.2** **12 Claims**



A braking device by which a spinning spool dispensing wire is stopped upon release of tension applied to the device. The device comprises a rigid frame member on one end of which is mounted a hinged arm having a brake shoe adapted to frictionally engage one of a pair of freely rotating rollers supporting and spinning or revolving the spool in its dispensing stall of a wire library, the other end of the frame member being adapted to be pivotally attached onto the wire library or dolly assembly. Bearing means, such as a sheave, is mounted on the one end of the frame member for introducing the dispensed wire to a tension system. In operation, the wire unwinds off of the spinning spool, passing through the sheave to the tension system. The brake shoe is free of the roller as long as tension on the wire at the bearing means is applied. Upon release of such tension, the weight of the device causes it to drop about its pivot, and as it does so, the brake shoe frictionally engages the one freely rotating roller about which the spool is revolving. The roller stops immediately, and thus also, the spool. The wire does not continue to unwind.

**3,819,128**

**AUTOMATIC SHUT-OFF DEVICE FOR A TAPE RECORDER**

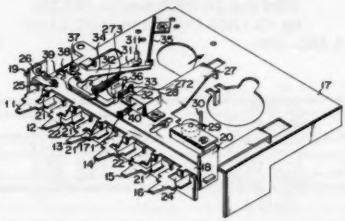
**Yasushi Hori, Tokyo, and Kesao Shindou, Yokohama, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan**

**Filed Dec. 28, 1971, Ser. No. 212,935**

**Claims priority, application Japan, Dec. 30, 1970, 45-133828[U]**

**Int. Cl. G03b** *1/02*; **G11b** *15/13*

**U.S. Cl. 242—189** **2 Claims**



Automatic shut-off device for a tape recorder comprises a movable plate movably mounted on a main chassis and having a magnetic head mounted thereon, means for locking the movable plate at a predetermined operating position upon pushing an operation lever and means for releasing the lock of the movable plate which is actuated by a tape tension applied to at the end of the tape.

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**3,819,129**

**DEVICE FOR TAKING UP THE END OF A WOUND TAPE**

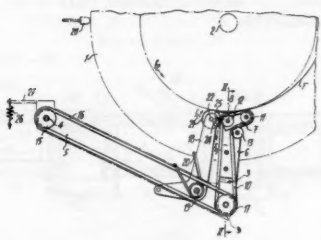
**Jean Thevenaz; Walter Etter, both of Grandson, and Louis Thevenaz, Sainte-Croix, all of Switzerland, assignors to Bolex International S.A., Sainte-Croix (Vaud), Switzerland**

**Filed Feb. 17, 1972, Ser. No. 227,199**

**Claims priority, application Switzerland, Mar. 3, 1971, 3120/71**

**Int. Cl. G03b** *1/56*

**U.S. Cl. 242—192** **6 Claims**



First and second rotary members are independently mounted on a support arm and can be brought into contact with the outer periphery of a tape wound on a spool. The first member is rotatably driven and the second member elastically applied against the first member, so that it is driven in the opposite direction, the parts of the members adjacent the wound tape tending move in direction towards one another. The second member is applied against the wound tape by a substantially different force than is the first member, for example a greater force, so that the second member drives the wound tape and brake means intermittently acting on the tape spool ensures that the outer spiral of tape is loosened. When the free end of the loosened tape leaves the second member it is driven

in the opposite direction by the first member and is taken up by a grooved surface on the second member which guides it between the first and second members, the tape then actuating means to disengage the second member from driving contact with the first member, so that when the tape end is extracted, the tape is driven solely by the first member and the second member is idly driven by the wound tape.

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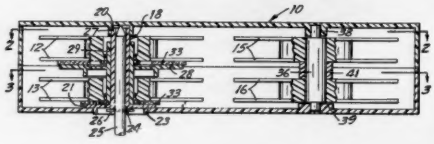
**3,819,130**
**FOUR-REEL MAGNETIC TAPE CARTRIDGE**
**James G. Moxness, N. St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**
**Filed Oct. 24, 1972, Ser. No. 300,204**
**Int. Cl. G03b** *1/04*; **G11b** *15/32, 23/04*
**U.S. Cl. 242—199** **3 Claims**



A magnetic tape cartridge in which two pairs of coaxial reels are rotatable about spaced parallel axes, each reel being aligned in planes perpendicular to said axes with one reel in the other reel pair. The reels in one coaxial pair are independently rotatable while the reels of the other pair are rotatable together. And, a first length of magnetic tape extends between two of the aligned reels and is convolutely wound about their axes in the same direction while a second length of magnetic tape extends between the other two aligned reels and is convolutely wound about their axes in opposite direction, the lengths of tape being wound on the independently rotatable reel pair in the same direction about their common axis.

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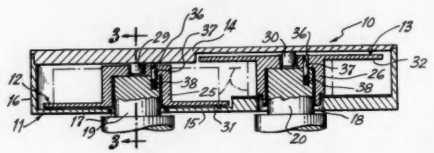
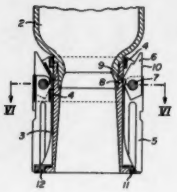
**3,819,131**
**TAPE CASSETTE**
**Katsu Inaga, 1047 Karasuyama-machi, Setagaya-ku, Tokyo, Japan**
**Continuation-in-part of Ser. No. 170,214, Aug. 9, 1971, Pat. No. 3,735,939. This application Nov. 3, 1971, Ser. No. 195,393**
**Int. Cl. G11b** *23/10, 15/32*
**U.S. Cl. 242—199** **1 Claim**



In a tape cassette adapted for use with a tape recording and/or reproducing apparatus having at least one reel shaft, the casing of the cassette has an aperture through which the reel shaft can extend into a coaxial socket opening at one end of a respective reel rotatably disposed within the casing, and the socket has an end wall surface remote from its open end and engageable by an end surface of the reel shaft, such end wall surface being at a greater axial distance from the open end of the socket than is the plane of the longitudinal median of the tape wound on the reel so that tension in the tape, when being wound or unwound on the reel, does not tend to withdraw the reel from the reel shaft or to tilt the reel relative to the reel shaft.

**3,819,132**
**SELF PROPELLED PROJECTILE WITH FINS**
**Maurice Rusbach, Vernier-Geneva, Switzerland, assignor to Sarmac S.A., Carouge-Geneva, Switzerland**
**Filed Feb. 21, 1973, Ser. No. 334,213**
**Int. Cl. F42b** *13/32*
**U.S. Cl. 244—3.28** **12 Claims**



The invention relates to a fin arrangement for a self-propelled projectile which comprises a sleeve mounted coaxially and slidingly over the rear part of the venture of the projectile. The fins are hinged to said sleeve. The sleeve is displaced under the acceleration force of the projectile, after having left the launching tube, from a forward rest position to a rearward service position. This rectilinear displacement of the sleeve causes the unfolding of the fins, the rear part of which are guided by means of guiding ramps, fast with the projectile, during said displacement.

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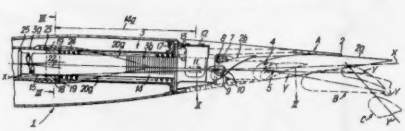
**3,819,133**
**AIRCRAFT FLAP SYSTEM**
**Norman Lee, Saint Annes-on-Sea, England, assignor to British Aircraft Corporation Limited, London, England**
**Filed Mar. 9, 1972, Ser. No. 233,172**
**Claims priority, application Great Britain, Mar. 12, 1971, 6722/71**
**Int. Cl. B64c** *3/50*
**U.S. Cl. 244—42 DA** **5 Claims**



In an aircraft, a lift-increasing flap system includes a flap carried on units which each comprise an actuator with a body and a ram capable of both relative linear movement to cause bodily movement of the flap and of relative rotational movement to cause a swinging movement of the flap, there being provided means to effect at least two different ratios of flap bodily movement to flap swinging movement so that during one portion of flap bodily movement the flap is swung at one rate and during another portion the flap is swung at a different rate.

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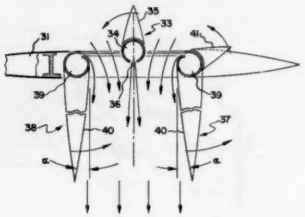
**3,819,134**
**AIRCRAFT SYSTEM LIFT EJECTOR**
**Lester W. Throndson, Westerville, Ohio, assignor to Rockwell International Corporation, Pittsburgh, Pa.**
**Filed Nov. 30, 1972, Ser. No. 311,011**
**Int. Cl. B64c** *15/06*
**U.S. Cl. 244—42 CC** **14 Claims**

Apparatus and methods of operation are disclosed for combining high-energy primary flow fluid (normally a gaseous medium obtained from an aircraft system primary power plant

or engine) and induced secondary flow fluid (ambient air) in the essentially conventional throat and diffuser sections of an ejector normally installed in an aircraft fixed wing, canard, or similar airfoil member to significantly increase ejector thrust augmentation ratio performance with a limited number of injection slots or openings of limited size to achieve high diffusion rates and substantially reduced propulsion energy losses



attributed to flow resistance, flow backage, and flow separation, to permit ejector configurations of relatively small planform and relatively short diffuser lengths, to achieve apparatus stowability in conventional flight, to achieve design simplicity which allows variable geometry ejector for installation in aircraft system wing and canard airfoils, and to obtain other important aircraft system operating characteristics.

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**3,819,135**

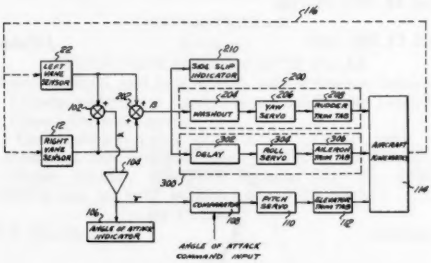
**SYSTEM FOR AUGMENTING AIRCRAFT ATTITUDE STABILITY USING VERTICAL VANE TYPE SENSORS**

**Eugene R. Foxworthy, Howell; Albert Blatter, Southfield; William N. Gamber, Howell; Rex W. Presley, Livonia, all of Mich., and Kenneth W. Verge, Mt. Vernon, Wash., assignors to The Bendix Corporation, Southfield, Mich.**

**Filed Dec. 15, 1972, Ser. No. 315,735**

**Int. Cl. B64c** *13/18*

**U.S. Cl. 244—77 D** **24 Claims**




A system is disclosed herein for augmenting the inherent attitude stability of an aircraft utilizing two vertical weathercock vane type sensors, one mounted near each wing tip of the aircraft. The sensors respond to the air flow and generate signals indicative of the direction of air flow at the wing tips relative to the longitudinal axis of the aircraft. Servo systems respond to the sum and differences of the signals generated by the vertical vane sensors and actuate flight control surfaces augmenting the attitude stability of the aircraft, including the angle of attack of the wing. Rapid system response further provides for excellent gust alleviation.

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**ERRATUM**

For Class 244—116 see:
Patent No. 3,818,958

**3,819,136**

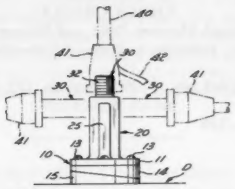
**MARINE ANTENNA MOUNT**

**Arthur A. Finke, Burton, Ohio, assignor to The Allen Group Incorporated, Los Angeles, Calif.**

**Filed Sept. 28, 1972, Ser. No. 292,981**

**Int. Cl. F16m** *13/00*

**U.S. Cl. 248—42** **6 Claims**




Marine antenna mount permits ready horizontal laydown in fore or aft direction of antenna normally locked in vertical position by means of internal slidable block upon which antenna is secured. The block is provided with closed-end slots to receive pivot bosses carried in the base of the mount in the upper part of the passageway in which the block is slidable and normally locked by the weight of the antenna when vertical. Lifting of antenna to uppermost position permitted by the slots permits the antenna and block to be pivoted to a fore or aft laydown position. Transverse openings intermediate the closed ends of the slot permits the antenna and attached block, when shifted while in a laydown position, to be lifted off the pivot bosses and thereby readily removed for storage without dismounting the base. The base is mounted through a pair of cylindrical shims truncated in plane skew to end surfaces of the shims when arranged as a right cylinder; rotation of shims with respect to each other accommodates the base to the cant of the mounting surface of the boat (e.g., deck or cabin top).

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**3,819,137**

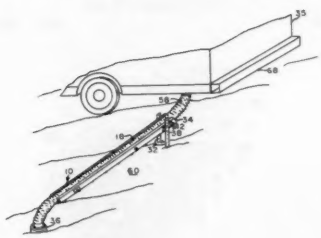
**TRESTLE FOR A FLEXIBLE HOSE**

**Harris L. Smith, 6109 Stratford, Huntsville, Ala. 35806**

**Filed Apr. 20, 1972, Ser. No. 245,973**

**Int. Cl. F16l** *3/00*

**U.S. Cl. 248—49** **2 Claims**




A trestle for a flexible hose such as a waste hose for recreational vehicles. The trestle includes a ladder having pivotal rungs enabling the ladder to collapse by moving the pole portions of the ladder together. In addition it includes adjustable means for elevating the ladder at one or both ends. The whole assembly is adapted to be stored when not in use within the

flexible hose which it supports which in turn is adapted to be stored and transported within the hollow bumper of a recreational vehicle.

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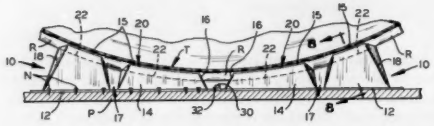
**3,819,138**
**CHOCK CRADLE**

**John W. Rehkopf, Maumee, Ohio, and Werner W. Barteck, La Salle, Mich., assignors to Rehkopf Industries, Inc., Toledo, Ohio**

**Filed July 17, 1972, Ser. No. 272,184**
**Int. Cl. B65d** *61/00*
**U.S. Cl. 248—146** **7 Claims**



A hollow vacuum formed linear polyethylene or molded glass fiber reinforced plastic pair of interlocking chocks which form a portable cradle for a circumferentially ribbed tank. The top of each wedge shaped chock may be longitudinally arcuately grooved to support and seat the rib on the tank. The side walls of each chock have vertical notches for increasing their strength, and base of each chock is outwardly flanged for anchoring it in position on a horizontal supporting surface. The section of this flange at the lower end of each chock may have a ridge for interlocking it with an adjacent chock to form the tank cradle.

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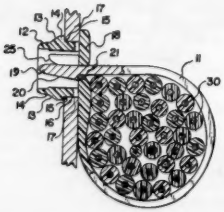
**3,819,139**
**CABLE HANGER**

**William Jemison, Summit, N.J., assignor to Heyman Manufacturing Company, Kenilworth, N.J.**

**Filed May 17, 1972, Ser. No. 253,996**
**Int. Cl. F16l** *3/12*
**U.S. Cl. 248—73** **9 Claims**

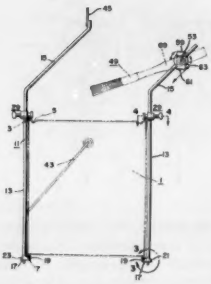


A cable hanger including a strap closure through the strap and head may be optionally closed over a bundle of cable, either before or after being snapped into an aperture. The head of the hanger includes grasping means to self lock in the aperture.

**3,819,140**
**APPLIANCE FOR PAINT CANS OR THE LIKE**

**Arthur H. Stewart, 4487 Hillsborough Dr., Castro Valley, Calif. 94546**

**Filed Oct. 5, 1972, Ser. No. 295,112**
**Int. Cl. B44d** *3/12*
**U.S. Cl. 248—110** **4 Claims**



An appliance attachable to a paint can or the like and capable of being designed for hanging a can of paint from a hook or the like, or for removably supporting a brush above the can opening. The appliance is adjustable to accommodate it to cans of different sizes.

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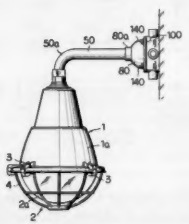
**3,819,141**
**DEVICE FOR ASSISTING ATTACHMENT OF HEAVY AND/OR BULKY ARTICLE**

**Shinjiro Mori, Tokyo, Japan, assignor to Mori Denki Manufacturing Co., Ltd., Tokyo, Japan**

**Filed Mar. 16, 1972, Ser. No. 235,115**
**Claims priority, application Japan, Dec. 28, 1971, 46-1164; Dec. 28, 1971, 46-1165**
**Int. Cl. F16m** *13/00*
**U.S. Cl. 248—223** **3 Claims**



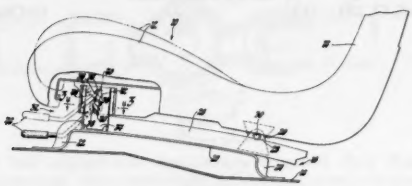
The attachment of, for example, a heavy illuminating appliance to a power source box fixed to a wall or a ceiling of a room or hall can be accomplished easily by a single operator with the help of an attachment assisting device comprising a support member to be fixed to the inside of the power source box and an engaging member to be mounted on the free end portion of a tube carrying a heavy illuminating appliance at the other end and also carrying therethrough an electric cable of this appliance. In the attaching operation, the operator first establishes engagement between the engaging member and the supporting member, so that the connecting of the appliance to the box is greatly facilitated, and the labor and cost are accordingly saved tremendously.

3,819,142

## LOCKING MECHANISM FOR A TILTING VEHICLE SEAT

Ernest L. DeFusco, Clawson, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 20, 1972, Ser. No. 308,028
Int. Cl. F16m *13/00*
U.S. Cl. 248—397 4 Claims



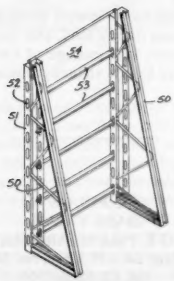
A locking mechanism for holding a tilting vehicle seat in a selected tilted position includes a locking element mounted on the seat adjuster which supports the seat for this tilting movement. The locking element includes an elongated arcuate slot generated about the axis of seat movement and including locking openings along each of its sides. These locking openings are arranged in opposed pairs along lines oriented at 45° to the elongated axis of the slot. A locking bar is rotatably mounted on the seat and includes an end portion of a generally rectangular cross section received within the slot in the locking element. A handle of the locking bar allows selective movement of the end portion between a first position where it is aligned with the slot to allow tilting seat movement and a second position where it is received within a selected pair of the locking openings to hold the seat in a selected tilted position. A positioning member is spring biased into engagement with a portion of the locking bar and includes a positioning groove for initially positioning the seat in an intermediate tilted position so as to align the end portion of the locking bar with the associated pair of locking openings for movement thereinto upon selected rotation of the locking bar.

3,819,143

## FORMWORK FOR CONCRETE WALLS

Ernest O. Butts, and John S. Hall, both of Ottawa, Ontario, Canada, assignors to Hambro Structural Systems Limited, Ottawa, Ontario, Canada

Continuation-in-part of Ser. No. 872,017, Oct. 29, 1969, abandoned. This application May 21, 1971, Ser. No. 145,758
Claims priority, application Canada, May 28, 1970, 084014; Mar. 16, 1971, 107895; Nov. 4, 1968, 034293
Int. Cl. E04g *11/06*
U.S. Cl. 249—33 2 Claims



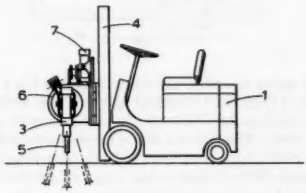
There is disclosed a building system utilizing steel joists spaced apart by spanner bars which also support rigid panels which act as formwork for the pouring of concrete. The spanner bars and the joists are so arranged to cooperate that the spanner bars may be removed together with the rigid panels after the concrete has been poured, and the spanner bars, the rigid panels and if desired the steel joists may be reused for formwork for additional poured concrete construction. Alternatively the joists may be left in place either with top chords embedded in the poured concrete to provide a composite action, or merely supporting the concrete slab in the conventional fashion. A novel cold rolled sheet steel joist may be advantageously used to form a particularly economical composite system. This steel joist is shaped in an I-beam configuration with an upper top chord bent to have the appearance of the letter Z in cross-section for bonding with the concrete floor.

3,819,144

## CRUST BREAKING MACHINE

Jens Bugge Hatlevoll, Ardalstangen; Per Jordal, Ovre Ardal, and Georg Sigurd Sivertsen, Tromso, all of Norway, assignors to A/S Ardal og Sunndal Verk, Oslo, Sweden

Filed Oct. 16, 1972, Ser. No. 297,709
Int. Cl. E21c *29/24*
U.S. Cl. 299—37 6 Claims



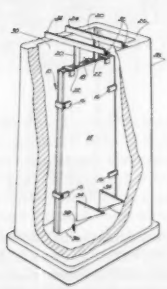
Crust breaking machine for breaking the crust on the electrolytic bath in electrolytic cells, in particular in enclosed cells, for producing metal such as aluminum. The machine comprises a self-propelled carriage provided with a cantilever arm which can be elevated and lowered and carries a hammer tool at its free end. The hammer tool is adapted to be swung about an axis which is substantially parallel to or coincident with the axis of the cantilever arm.

3,819,145

## INSERT ASSEMBLY FOR CAST COMPOSITE INGOT

Richard O. Huber, Ashland, Ky.; David A. Higbee, Middletown, and John W. Young, Franklin, both of Ohio, assignors to Armco Steel Corporation, Middletown, Ohio

Filed July 17, 1972, Ser. No. 272,381
Int. Cl. B22d *17/24*
U.S. Cl. 249—205 9 Claims



A core insert assembly for use in an ingot mold to produce a composite ingot having a thin stainless steel core. The core in-

sert assembly comprises a plate of stainless steel with at least its major surfaces covered by metallic protective layers. Means are provided at the top of the core insert assembly by which it may be supported within the ingot mold and means are also provided to prevent excessive lateral movement of the core insert assembly within the ingot mold.

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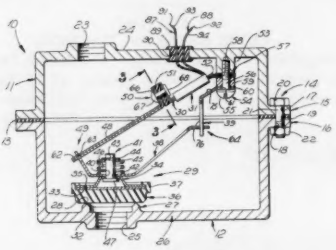
**3,819,146**
**VALVE ASSEMBLY**

**John W. Dobson, Burbank, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.**

**Filed Sept. 5, 1972, Ser. No. 286,165**
**Int. Cl. F16k** *31/02*; **F03g** *7/06*
**U.S. Cl. 251—11** **1 Claim**



A heat motor operated valve assembly that has a housing, a valve seat, a lever, and a bimetal operator. The lever is loosely hinged to the housing. The valve has a lost motion connection with the lever. The bimetal has a loose connection with the lever. The valve does not wear and provides a good seal with its seat over an extremely wide range of ambient temperatures. Prior heat motor actuated valves wore badly and did not seal at low and high ambient temperatures.

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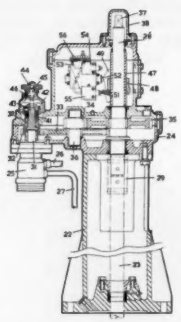
**3,819,147**
**VALVE ACTUATORS**

**William McKenzie Meek Morrison, Shandon, 107, Coalway Rd., Wolverhampton, Staffordshire, England**

**Filed Feb. 9, 1973, Ser. No. 331,197**
**Claims priority, application Great Britain, Feb. 9, 1972, 6102/72**
**Int. Cl. F16k** *31/143*
**U.S. Cl. 251—14** **7 Claims**



A valve actuator, particularly for oil tanker ships, the actuator having a hydraulic motor to drive an actuating rod of the valve, and a hydraulic control valve which regulates the supply of hydraulic fluid to the motor in accordance with the actuator rod position so that differing forces are applied to the valve during opening and closing.

**3,819,148**
**DIAPHRAGM VALVE FOR LIQUIDS**

**George S. Cole, 300 E. Main St., Barrington, Ill. 60010; Richard L. Ritzenthaler, 530 Devonshire Ln., Crystal Lake, Ill. 60014, and Don C. Arnold, 113 Cypress Ct., Palatine, Ill. 60067**

**Division of Ser. No. 67,346, Aug. 27, 1970, Pat. No. 3,738,389. This application June 8, 1973, Ser. No. 368,061**
**Int. Cl. F16k** *31/524*
**U.S. Cl. 251—252** **10 Claims**

A diaphragm valve for liquids wherein a cylindrical valve body has a surface recess at one end which receives a resilient valve member of rubber-type material of conforming size. An inlet port from a supply duct and an outlet port to a discharge duct are located in the valve body recess in spaced relation with the recess walls and bottom engaged by the valve member. A retainer holds the valve member in the recess and applies sufficient pressure on the marginal portion of the valve member to establish a liquid-proof seal between the valve member and valve body which exists at least at low liquid pressure. The resilient valve member responds to liquid pressure within the valve, and the seal with the valve body is enhanced in proportion to liquid pressure, giving the valve a self-sealing characteristic over a wide range of liquid pressures. A movable actuator has a cam surface which positions the resilient valve member in relation to the inlet port, closing the port in one position, and in other positions varying the spacing between the valve member and port for varying the rate of flow through the valve. The various parts of the valve, including the actuator, are preassembled economically, and the valve is installed at the point of use as a unit, thereby avoiding any installation step, such as a conventional compression seal, which might permit leakage in the valve.

The liquid handled by the valve flows from the supply duct to the discharge duct without traversing a region within the valve from which leakage is possible as a result of abuse or improper installation.

Valves embodying the invention easily can be installed by the user without tools of any kind, and the structure involved in installation is such that leakage at the couplings for the supply and discharge lines is virtually impossible.

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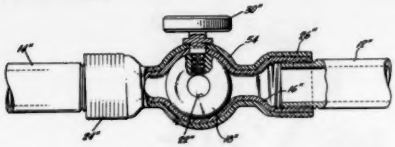
**3,819,149**
**BALL VALVE**

**Allan R. Kinder, 942 E. Palm St., Altadena, Calif. 91001**

**Filed May 24, 1973, Ser. No. 363,501**
**Int. Cl. F16k** *5/06*
**U.S. Cl. 251—309** **11 Claims**

A ball type valve, joint and stop for fluid conduits and a method of making same. The stop comprises a heat shrinkable

length of tubing, and a ball disposed within said tubing, the tubing being heat shrunk in sealed relation around the ball and the tubing ends being adapted for connection to a fluid conduit. The joint is similar to the stop and includes a passage in



the ball aligned with the tubing to permit fluid flow therethrough. The valve includes the elements of the joint plus means passing through the tubing for rotating the ball to permit selective opening and closing of the ball passage.

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**3,819,150**

## BALL PLUG VALVE

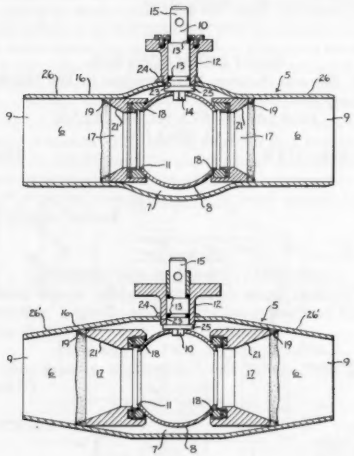
**Bengt Ake Kajrup, Malmo, Sweden, assignor to Saab-Scania Aktiebolag, Linkoping, Sweden**

**Filed Aug. 14, 1972, Ser. No. 280,475**

**Claims priority, application Sweden, Aug. 16, 1971, 10371/71**

**Int. Cl. F16k** *5/06*

**U.S. Cl. 251—315** **4 Claims**



The body of a ball plug valve comprises a unitary outer tubular part and annular seat members, one at each side of the valve element, coaxially secured therein as by welds around their axially outer ends. A resilient seal ring on the inner end of each seat member is compressed between it and the valve element. Until welding is completed, the axial positions of the seat members relative to the tubular part are established by the valve element stem, confined to rotation relative to said part, and by a fixture exerting axial converging force on the seat members. Before welding, and after the fixture-held assembly is inserted, end portions of the tubular part are reduced in diameter to define ports smaller than the valve element.

**3,819,151**

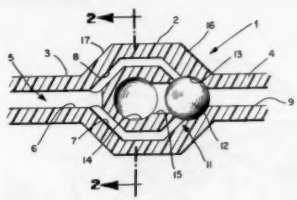
## FLEXIBLE VALVE

**Charles A. Kish, 22 W. Sixth St., Bridgeport, Pa. 19405**

**Filed Sept. 22, 1972, Ser. No. 291,223**

**Int. Cl. F16k** *31/44*

**U.S. Cl. 251—342** **2 Claims**



A valve for controlling the flow of fluid in a line. The valve has a flexible body which when squeezed in one area moves a plunger to open the line and when squeezed in another area moves a plunger to close the line.

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**3,819,152**

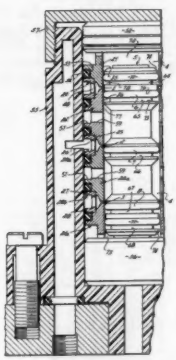
## ANNULAR PORT CONSTRUCTION FOR SPOOL VALVE

**William L. Clippard, III, Cincinnati, Ohio, assignor to Clippard Instrument Laboratory, Inc., Cincinnati, Ohio**

**Continuation-in-part of Ser. No. 206,636, Dec. 10, 1971, Pat. No. 3,766,935. This application Sept. 1, 1972, Ser. No. 285,937**

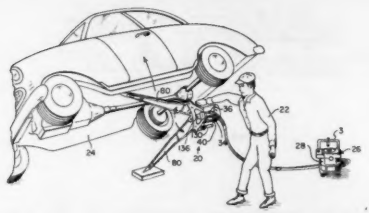
**Int. Cl. F16k** *27/04, 11/00*

**U.S. Cl. 251—367** **9 Claims**



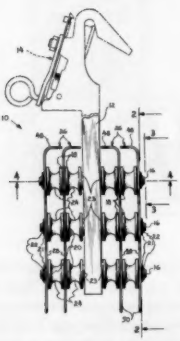
A spool valve of the type wherein a flexible sealing member on a movable spool valves the flow of fluid through a port in the form of a narrow annular gap extending circumferentially around the spool chamber. The port is formed by a stack of three interfitting elements, including a pair of annular elements having opposed circular internal edges that form the respective edges of the port, and an annular locator which spaces the two port edge-forming elements apart and at the same time aligns them axially. Movement of the sealing member relative to the spool which carries it enables a "snap action" valving to take place as the sealing member moves across the port.

3,819,153
RESCUE TOOL
George H. Hurst, Huntingdon Valley, and James F. Hobbins, Philadelphia, both of Pa., assignors to Hurst Performance, Inc., Warminster, Pa.
Filed Apr. 26, 1972, Ser. No. 247,553
Int. Cl. B66f 3/00, 3/24
U.S. Cl. 254—93 R 29 Claims



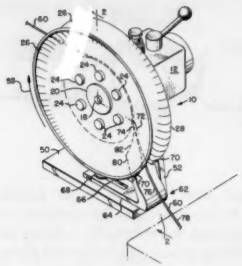
A lightweight, fluid powered portable rescue tool for applying high magnitude, push/pull forces comprising a base and a pair of force arms supported for pivotal movement adjacent to inner ends about spaced parallel axes on opposite sides of the longitudinal axis of said base. Fluid actuated force means is movable along the longitudinal axis of the base for pivoting the arms to move the outer ends toward and away from each other to close and open. Handle means is provided for manipulating the rescue tool to position the outer ends of the arms in the desired location and a pair of controls is disposed on opposite sides of the base conveniently adjacent the handles for controlling the fluid actuated force means to pivot the force arms toward or away from one another as desired.

3,819,154
MULTIPLE CABLE BLOCK
Glenn G. Miller, R.D. No. 1, Lewisburg, Pa. 17837
Filed Dec. 14, 1972, Ser. No. 314,956
Int. Cl. E21c 29/16
U.S. Cl. 254—134.3 PA 11 Claims



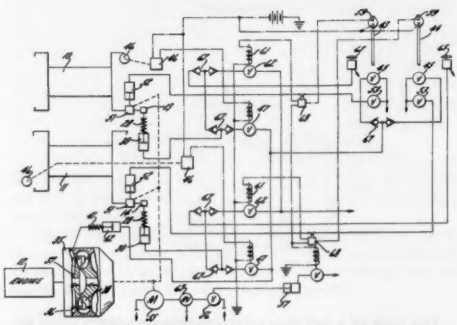
A multiple cable block with at least two rollers positioned one above the other and a cable gate rotatably mounted on the shaft of the lower roller and disengageably mounted on the shaft of the upper roller whereby the gate may be rotated away from the upper shaft to permit positioning of cables onto both rollers.

3,819,155
LINE PULLING APPARATUS
William E. Smith, 208 S. Kelsey, Monroe, Wash. 98272
Filed Aug. 28, 1972, Ser. No. 284,243
Int. Cl. B66d 1/76
U.S. Cl. 254—175.5 2 Claims



A pair of like shaped concave plates having flanged edge portions, the plates being joined together back-to-back on a circular line inwardly from their peripheries to form a nip. The joined plates are centrally mounted on a rotatable shaft and drive means are provided to rotate the shaft such that a line laid between the flanged edges of the plates is pulled down into the nip and wrapped around the juncture of the plates. A non-metallic line stripping means is mounted adjacent the rotating plates and includes an elongate finger means extending between the plates and into the nip formed therebetween to completely fill the space between the flanged plates to remove the line from the nip and prevent its being wrapped completely around the rotating plates.

3,819,156
HOIST DRUM CONTROL
David A. Sieracki, Newton, Wis., assignor to The Manitowoc Company, Inc., Manitowoc, Wis.
Filed July 25, 1973, Ser. No. 382,544
Int. Cl. B66d 1/50
U.S. Cl. 254—173 R 3 Claims

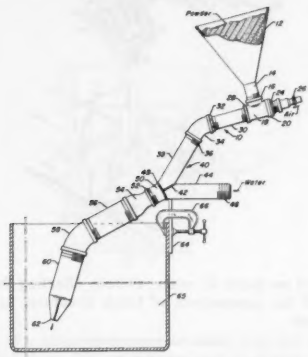


A hoist cable drum control having a spring set, normally engaged drum brake and a variable torque converter for driving the drum, in which a control device initiates cable take-up and slips the brake, and drum rotation is sensed to thereafter disengage the brake. Control forces on the converter and the brake are proportional so that as torque is reduced the brake comes on smoothly. Cable is payed off the drum through a reverse driving hydraulic motor actuated simultaneously with release of the brake and capable of being overridden by the torque converter to control "lowering" movement. A clutch engaged by initial operation of the control device permits multiple drums to be driven by the converter.

## 3,819,157
## MIXING APPARATUS

Reinhold S. Markfelt, Minneapolis, Minn., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed Feb. 1, 1973, Ser. No. 328,802
Int. Cl. B01f 5/00, 15/02
U.S. Cl. 259—4 10 Claims

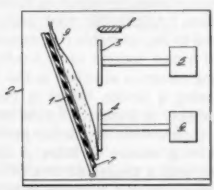


Improved mixing apparatus permits dry powdered material such as guar gum drilling fluid additives to be mixed with water quickly and completely and without having the powder form hard-to-eliminate gum balls. The apparatus comprises a wye fitting having a pair of inlet pipe branches or arms for receiving water and powder, respectively. The inlet branches are joined to each other at a 60° angle. At their juncture, which defines a mixing chamber, they are joined to an outlet pipe which forms the stem of the wye fitting and has a diameter greater than the diameter of the inlet branches. During operation, powder is fed through one of the inlet branches from a hopper into contact with a water stream fed into the mixing chamber by the other of the inlet branches. The powder is carried to the mixing chamber by a stream of compressed air which sucks the powder from a supply hopper by means of an eductor. The improved mixing apparatus is capable of providing complete mixing at much greater feed rates than prior art mixers.

## 3,819,158
## DEVICES FOR BLENDING MATERIALS

Anthony Nelson Sharpe, and Adrian Keith Jackson, both of Rushden, England, assignors to Lever Brothers Company, New York, N.Y.

Filed Aug. 17, 1972, Ser. No. 281,594
Claims priority, application Great Britain, Sept. 6, 1971, 41395/71
Int. Cl. B01f 11/00
U.S. Cl. 259—72 4 Claims

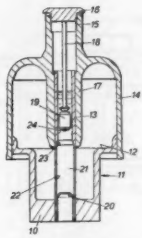


A device for blending materials, particularly for the preparation of samples for bacteriological analysis, where a bag containing a sample is subjected to a kneading action while held on a backing plate.

## 3,819,159
## CARBURETTERS FOR INTERNAL COMBUSTION ENGINES

Peter P. Swatman, Solihull, and John Edgar Tullett, Knowle, both of England, assignors to British Leyland (Austin-Morris) Limited, Birmingham, England

Filed Feb. 14, 1973, Ser. No. 332,422
Int. Cl. F02m 9/06
U.S. Cl. 261—44 R 5 Claims

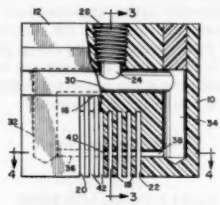


The piston assembly of a carburetter of the controllable jet automatic variable-choke type includes a piston rod having a bore extending through it. Displacement of the rod is damped by means of a plunger mounted in the bore which in use contains a liquid. To vary the damping action of the plunger in dependence on the relative axial position of plunger and rod the bore is shaped to vary the plunger-bore clearance.

## 3,819,160
## AERATOR HEAD

Rolland C. Sabins, Lakeside, Calif., assignor to Saratoga Development Corporation, San Diego, Calif.

Filed Aug. 9, 1972, Ser. No. 278,982
Int. Cl. B01f 3/04
U.S. Cl. 261—123 5 Claims



An aerator head for injecting air below water with high turbulence and mixing efficiency. The head is in the form of a block containing internal ducts through which air is conducted from an inlet connection to a pair of outlet orifices directed toward each other across a slot in the block. Impact of the air streams against each other causes considerable turbulence and water circulation. In one form of the head, fins are fixed in spaced relation between the orifices, with openings to allow partial passage of the air through and between the fins for added mixing effect.

**3,819,161**

## STEEL MILL ARRANGEMENT AND IMPROVED CONVERTER CONSTRUCTION AND HANDLING EQUIPMENT FOR A STEEL MILL

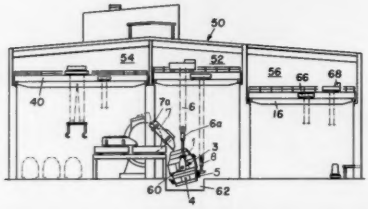
**Gotthard Hubatsch, Mulheim (Ruhr), Germany, assignor to Demag Aktiengesellschaft, Aluisburg, Germany**

**Division of Ser. No. 619,711, March 1, 1967, abandoned. This application Oct. 17, 1968, Ser. No. 798,507**

**Claims priority, application Germany, Mar. 2, 1966, 58613**

**Int. Cl. C21c** *5/00*

**U.S. Cl. 266—13** **2 Claims**




A complete steel mill plant is described in respect to the arrangement of separate overhead crane elements for transporting a converter in respect to a scrap charging stand, a pig mixer, a tapping stand, a blowing stand and a pouring station, ..c. In accordance with the invention, the mill plant is provided with three elongated halls disposed side by side, including a scrap and pig movement hall, a converter movement or operations hall and a pouring hall arranged in that order. The scrap and pig movement hall includes an overhead conveyor for conveying scrap material and pig to the scrap charging stand and pig mixer which are accessible from the operations hall. The operations hall includes an overhead crane having two separate vertically movable hook elements which are engageable with a converter in a manner such that the converter may be lifted and tilted about a substantially horizontal axis. For this purpose the converter is especially constructed and includes suspension loops or arms which are pivotally mounted on each side of the converter and they may be held to permit tilting of the converter about an axis defined by a projecting axle on each side of the converter. The tilt axis of the axles extends substantially horizontal through the center of the converter. The upper loop ends of the suspension arms may be engaged by hooks from one of two lifting devices of an overhead crane movable in the operations hall. The converter also carries loops or eyelets adjacent the bottom thereof which may be engaged by the second lifting device from either side of the converter in order to lift the lower end of the converter for the tilting movement of the converter about the horizontal axis defined by the side suspension loops.

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**3,819,162**

## GAS CUTTING MACHINE

**Nobuhiro Inomata, Kanagawa; Eiji Ohba, and Tomowo Ogiwara, both of Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan**

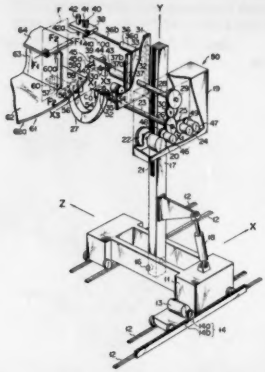
**Filed Nov. 8, 1972, Ser. No. 304,837**

**Claims priority, application Japan, Nov. 10, 1971, 46-89679**

**Int. Cl. B23k** *7/10*

**U.S. Cl. 266—23 M** **13 Claims**

A gas cutting machine comprising a truck; a pole rotatably erected thereon, a sensor following the guide plane of a block structure; a torch head movable together with the sensor along the pole and rotatable in the same direction and through the same angle as the sensor; and control mechanism for causing the truck, sensor and torch head to run at a prescribed speed and properly adjusting the angle through which the sensor and




torch head are made to rotate, thereby effecting the thermal cutting of the components of block structures to accurate dimensions.

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**3,819,163**

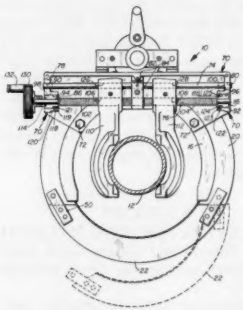
## SELF CENTERING PIPE WORKING MACHINE

**Gerald A. Stunkard, Jenks, Okla., assignor to DND Corporation, Houston, Tex.**

**Continuation of Ser. No. 874,759, Nov. 7, 1969, abandoned. This application Dec. 20, 1971, Ser. No. 209,592**

**Int. Cl. B23k** *7/04*

**U.S. Cl. 266—23 NN** **14 Claims**



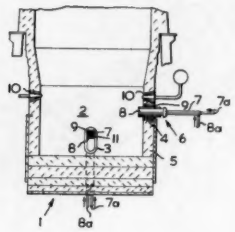
A self centering pipe working machine has a circular frame portion positionable around a pipe section, an openable ring assembly in movable contact with the periphery of the frame portion, and a pair of self centering clamp members positioned on a clamping assembly which is further attached to said frame portion. Adjustable tool support means is removably attached to the openable ring member for rotative movement around a pipe section to be worked. In one embodiment, a driving means is attached to the frame with the driving means having a driven wheel in contact with the rotatable ring assembly in order to rotate the tool support means around the pipe section. In another embodiment of the invention, the driving means includes a driven sprocket member in contact with a chain-like member secured to the periphery of the openable ring assembly in order to drive the ring assembly. The clamping members move in opposite motion to each other slidably along a guide member by reason of having a threadable portion cooperating with oppositely threaded parts of a screw member parallel to the guide member.

3,819,164

## OPERATION OF A BLAST FURNACE

William Wells, and Derek W. R. Haysom, both of Sydney, Nova Scotia, Canada, assignors to Sydney Steel Corporation, Sydney, Nova Scotia, Canada

Filed Oct. 30, 1972, Ser. No. 301,808
Claims priority, application Canada, Oct. 13, 1972, 153869
Int. Cl. C21b 7/16
U.S. Cl. 266—29 5 Claims



The use of a lance comprising an inner tube and an outer tube spaced from the inner tube and preferably coaxial therewith, oxygen being passed through the inner tube and hydrocarbon fuel, such as propane, being passed through the gap between the inner tube and the outer tube in the restarting of a blast furnace which has gone cold, the lance being initially present at both the cinder notch and the iron notch of the blast furnace.

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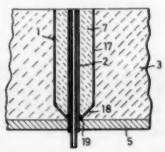
3,819,165

## DEVICE FOR BLOWING-IN OXYGEN THROUGH THE REFRACTORY LINING OF A METALLURGICAL CONVERTER

Camille Alphonse Courard, Belgien-Angleur, Belgium, and Ernst Fritz, Rosenberg, Germany, assignors to Eisenwerk Gesellschaft Maxmilianshutte GmbH, Sulzbach Rosenberg, Germany

Filed Dec. 8, 1972, Ser. No. 313,309
Int. Cl. C21c 5/48
U.S. Cl. 266—41 1 Claim



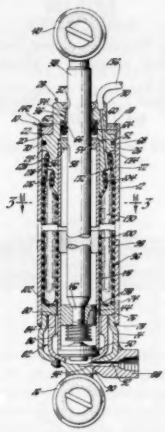
In a tuyere assembly for blowing-in oxygen through the bottom of a metallurgical converter in which the tuyere comprises two tubes, a center tube passing oxygen into the converter and a tube surrounding the oxygen tube and opening into the converter, for conducting a protective fluid such as a liquid hydrocarbon into the converter, the improvement which consists principally in preventing hydrocarbon from forming an accumulation in the region adjacent to the outlet end of the dual tube tuyere, especially in the converter bottom adjacent thereto.

3,819,166

## GAS BLADDER FOR COMBINATION LIQUID GAS SUSPENSION DEVICE

George S. Ellis, Madison, Wis.; John Robertson, Royal Oak, and Ming-Chin Yew, Sterling Heights, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 12, 1972, Ser. No. 296,762
Int. Cl. F16f 5/00
U.S. Cl. 267—64 R 4 Claims



A combination gas and liquid suspension device having an inner pressure cylinder surrounded by an outer cylinder to form a liquid filled reservoir space therebetween. An open end of the outer cylinder is closed by a member on which is supported a U-shaped bladder to form a sealed gas chamber depending from the open end of the outer cylinder into the liquid filled reservoir space. The bladder is charged through a passageway formed in the member and is sealed integrally therewith. Means are provided to vary the amount of liquid within the reservoir and inner cylinder to vary the gas pressure within the gas space to produce changes in the resultant force on a piston rod to control the height relationship between the sprung and unsprung mass of the vehicle.

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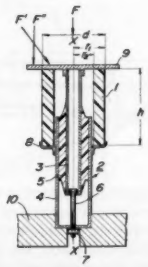
3,819,167

## BUFFERING DEVICE

Kihei Nakamura, Yokohama; Harumichi Yamazaki, and Yoshikazu Kondo, both of Tokyo, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Nov. 15, 1972, Ser. No. 306,835
Claims priority, application Japan, Nov. 17, 1971, 46-91466
Int. Cl. F16f 7/12
U.S. Cl. 267—139 5 Claims



A buffering device for protecting a body, comprising an impact-receiving plate carrying a hollow resilient cylindrical buf-

fering member, a core shaft coaxially secured to the impact-receiving plate, an intermediate hollow shaft extending from the body into the space between the buffering member and the core shaft, and an elastomeric filler secured to the core shaft and the intermediate shaft so as to fill the space therebetween. The opposite end of the buffering member to the shock-receiving plate is secured to the intermediate shaft.

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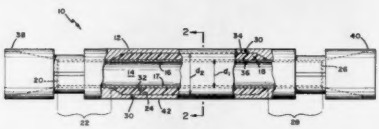
**3,819,168**
**DRILL SHAFT**

**Russell H. Nittinger, Morristown, and Donald O. Taylor, Parsippany, both of N.J., assignors to Allied Chemical Corporation, New York, N.Y.**

**Filed June 7, 1972, Ser. No. 260,649**
**Int. Cl. F16f** *15/08*
**U.S. Cl. 267—141** **9 Claims**



A drill shaft capable of reducing the noise produced by percussion type rotary drilling machines is provided. The drill shaft has a housing means of conventional construction. A hollow form means, or pipe, is positioned within the housing means and extends substantially the entire length thereof. A damping means, disposed between the housing means and the hollow form means, contacts a substantial portion of the housing means and dissipates the mechanical vibrational energy imparted thereto by the striking action of a piston reciprocally moving thereabove. Once dissipated, the mechanical vibrational energy cannot be radiated in the form of air-borne noise, and the need for more expensive apparatus capable of absorbing and isolating air-borne noise is eliminated. As a result, the noise produced during operation of percussion type rotary drilling apparatus can be substantially reduced in an economical manner.

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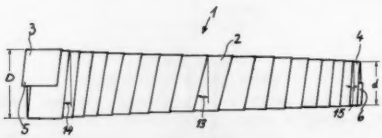
**3,819,169**
**TELESCOPING SHIELD SPRING**

**Helmut Imme, Friedberg; Robert Blaimberger, and Gunter Schulz, both of Augsburg, all of Germany, assignors to Fa. J. N. Eberle & Cie. GmbH, Augsburg, Germany**

**Filed Apr. 17, 1972, Ser. No. 244,500**
**Claims priority, application Germany, Apr. 17, 1971, 2118728**
**Int. Cl. F16f** *1/08*
**U.S. Cl. 267—155** **10 Claims**

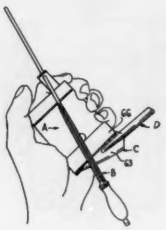


A telescoping shield spring is formed as a frustoconical tube from a spring-steel band wound upon itself with a progressively steeper(greater) pitch from its ends toward its middle. Each end carries a sleevelike end piece, the piece at the large-diameter end surrounds the spring with slight clearance and the piece at the small-diameter end is tightly received within the spring.

**3,819,170**
**PORTABLE SHARPENER**

**Howard Ray Longbrake, P.O. R.D. 2, Grafton, Ohio 44044**

**Continuation-in-part of Ser. No. 104,940, Jan. 8, 1971, Pat. No. 3,733,933. This application Oct. 24, 1972, Ser. No. 299,926**
**Int. Cl. B21k** *5/12*
**U.S. Cl. 269—3** **5 Claims**



A sharpener to be held in one hand of an operative and comprising clamp members between which an article, arrowhead, knife, etc., having a cutting edge to be sharpened or resharpened, is secured and pivoted tool guide members extending transversely of the clamp members and each having an aperture therein in which one end of a sharpening instrument or tool, such as, a file, stone, etc., is received while the other end is held by the other hand of the operator and moved over the cutting edge to be sharpened or resharpened.

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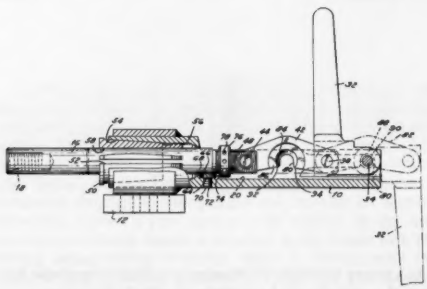
**3,819,171**
**PLUNGER CLAMP**

**Jack J. Sendoykas, Grosse Pointe Park, and Alexander W. McPherson, Farmington, both of Mich., assignors to Dover Corporation (De-Sta-Co Division), Detroit, Mich.**

**Filed Mar. 6, 1972, Ser. No. 231,997**
**Int. Cl. B25b** *1/14, 5/12*
**U.S. Cl. 269—228** **10 Claims**

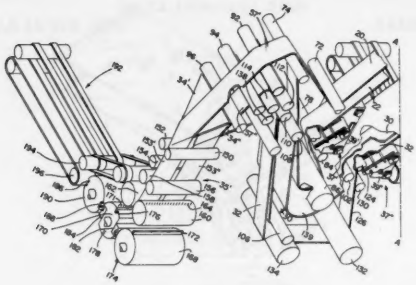


An improved toggle operated plunger clamp having control means for inhibiting the movement of the plunger when unloaded. The control means includes adjustable collet and adjustable key means operative to engage the clamp at intermediate positions as well as auxiliary retaining means operative in both the fully closed and fully open positions when the plunger is otherwise unloaded.

## 3,819,172
## METHOD AND APPARATUS FOR FORMING A PLURALITY OF BOOKLETS

F. Gregory Santaella, Philadelphia, Pa., assignor to Goodway, Inc., Philadelphia, Pa.

Filed Aug. 20, 1971, Ser. No. 173,594
Int. Cl. B411 *43/04*
U.S. Cl. 270—41 4 Claims

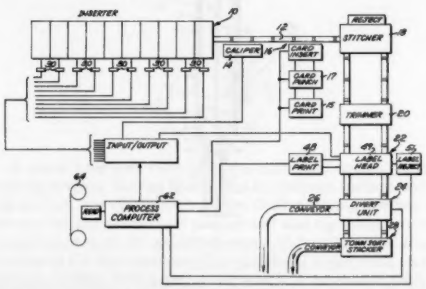


A method of forming a plurality of individual booklets, or the like, having removable insert members affixed thereto. The method includes severing at least one continuous web of printed paper along transversely spaced, elongate lines to form continuous ribbons; affixing a plurality of insert members to one surface of at least one of the continuous ribbons at spaced, longitudinal intervals; longitudinally folding a ribbon having insert members affixed thereto to form continuous multi-leaf booklets and transversely severing each continuous multi-leaf booklets to form a plurality of individual booklets, each containing at least one insert member. The method also includes severing more than one continuous web of printed paper into ribbons, and securing predetermined ribbons to each other to form sets of ribbon prior to the longitudinal folding and transverse severing operations. The apparatus for forming a plurality of booklets also forms a part of this invention.

## 3,819,173
## METHOD AND APPARATUS FOR PRODUCING MAGAZINES OR THE LIKE

Frederick Douglas Anderson, Shaker Heights, Ohio, and David Austin Reed, Easton, Pa., assignors to Harris-Intertype Corporation, Cleveland, Ohio

Filed Sept. 1, 1971, Ser. No. 176,851
Int. Cl. B65h *39/02*
U.S. Cl. 270—54 13 Claims

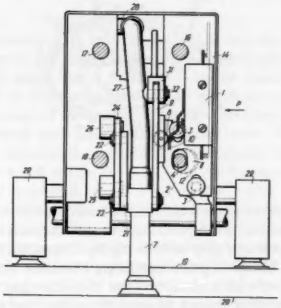



A method and apparatus for producing different magazines composed of different predetermined combinations of signatures for different subscribers in a continuous process and which includes on-line printing and/or punching and insertion of individual subscriber's subscription renewal or information cards, on-line printing upon command of each subscriber's label and complete custody of the subscriber's magazine throughout the process so that if any particular subscriber's magazine is defective it is rejected and a new magazine is reordered.

## 3,819,174
## ARRANGEMENT FOR GENERATING CONTROL PULSES FOR THE ADJUSTMENT OF THE LEVEL OF A FEED BOARD PARTICULARLY FOR PRINTING MACHINES

Jaroslav Jiruse, Blansko, Czechoslovakia, assignor to Adamovske strojirny, narodni podnik, Adamov, Czechoslovakia

Filed Sept. 4, 1969, Ser. No. 855,258
Int. Cl. B65h *1/18*
U.S. Cl. 271—154 4 Claims

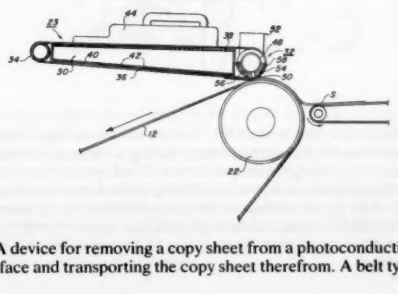


The level of a stack of paper sheets on a feed board, from which individual sheets are transferred in the course of printing to the printing cylinders is maintained at a proper height using a feeler determining the actual level of the stack. The feeler is provided with an extension, which actuates a switch fixed on a vertically slidable supporting board itself provided with regulating means for adjusting the height of said supporting board with respect to the supporting body. The thus generated control pulses actuate electromagnetic means or an electric motor, raising the feed board to the proper level.

## 3,819,175
## VACUUM STRIPPING ROLL WITH STATIONARY PICKUP SLOTS

Stephen Borostyan, Fairport, and John J. Bigenwald, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 5, 1972, Ser. No. 312,401
Int. Cl. B65h *29/56*
U.S. Cl. 271—174 2 Claims



A device for removing a copy sheet from a photoconductive surface and transporting the copy sheet therefrom. A belt type

transport system is provided with stationary vacuum ports in the transport belt roller assembly to lift the leading edge of a copy sheet being advanced on a photoconductive surface. Vacuum ports in the belt transport platen communicate with perforations in the transport belts to provide a low pressure area adjacent the belts for retaining the copy sheet on the transport for movement away from the photoconductor.

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**3,819,176**

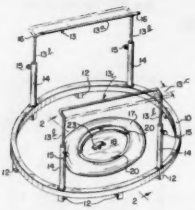
**EXERCISE COMPLEX INCLUDING BUMP RING AND PLATFORM-TYPE EXERCISER THEREIN**

**Alfred B. Cummins, 401 Miles Rd., Chagrin Falls, Ohio 44022**

**Filed Sept. 14, 1973, Ser. No. 397,235**

**Int. Cl. A63b** *3/00*; **B62b** *1/00*

**U.S. Cl. 272—63** **8 Claims**



An exercise complex is presented having a bump ring supported a few inches above a smooth surface such as a floor or platform, with user grip handles rigidly connected to the upper side of the bump ring and extending vertically upward a few feet, together with a platform-type play exerciser which rolls easily in any direction on the smooth surface and inside of the bump ring, the user standing, squatting, kneeling, or in any other desired position and moving the play exerciser around the interior portion of the bump ring while steadying himself on the fixed grip handles.

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**3,819,177**

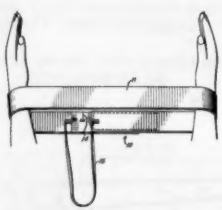
**ELASTIC EXERCISE BELT**

**Irving Spiro, 1400 20th St., Miami Beach, Fla. 33142**

**Filed Jan. 31, 1972, Ser. No. 222,348**

**Int. Cl. A63b** *21/02*

**U.S. Cl. 272—82** **1 Claim**



An elastic exercise belt for "isometrics" exercising comprising a length of elastic webbing having a pressure-sensitive means for joining the ends to form a closed loop and operative to release upon tensional force being applied in stretching the belt. The pressure-sensitive means, preferably in the form of "VELCRO" strips, can be calibrated and adjusted as to force of release by controlling the area of pressure-sensitive strip overlap.

**3,819,178**

**APPARATUS FOR DEFINING A RUNWAY COURSE OF A RUNNING MODEL**

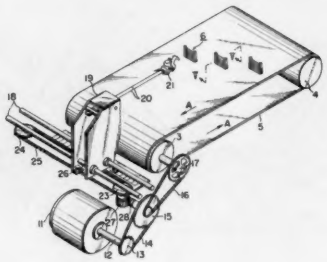
**Shikanosuke Ochi, Tokyo, Japan, assignor to Kabushiki Kaisha Sega Enterprises, Tokyo, Japan**

**Filed Feb. 16, 1973, Ser. No. 332,790**

**Claims priority, application Japan, July 6, 1972, 47-79186**

**Int. Cl. A63f** *9/00*

**U.S. Cl. 273—1 E** **5 Claims**



A runway course defined by a belt or drum having a ground surface depicted on its outer face is rotatably driven by a motor through a belt and pulley arrangement. A model depicting an animal or vehicle is positioned over the runway course thereby giving the illusion that the model is moving over the ground surface. The model is driven laterally with respect to the axis of rotation of the runway course by a reciprocating chain drive or lead screw which is in turn driven by the aforesaid motor. The lateral velocity of movement is in a predetermined relationship to the velocity of rotation of the runway course. Obstacles are located on the runway course and the model is mounted on a pivotal framework which can be actuated to raise the model over the obstacles.

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**3,819,179**

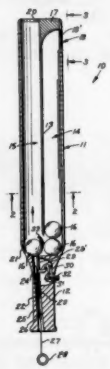
**BALL BAT**

**James R. Ambler, Jr., 4812 W. Dakin St., Chicago, Ill. 60641, and James M. Ambler, Sr., 2046 N. Kedzie Ave., Chicago, Ill. 60647**

**Filed Aug. 16, 1972, Ser. No. 281,026**

**Int. Cl. A63b** *69/40*

**U.S. Cl. 273— 26 B** **2 Claims**



A toy bat which will receive and reject a plurality of balls for batting pratice. This device consists primarily of a tubular structure having a divider wall defining a pair of compart-

ments; one of which receives and stores a multiple number of balls and the other which provides passageway means for ejecting a single ball at a time, a mechanism for firing including a piston, a spring and lever means for ejecting a single ball.

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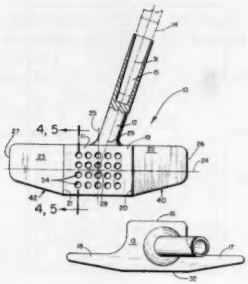
**3,819,180**
**PERFORATED GOLF PUTTER**
**Thomas F. Murphy, 48 Oakley Way, Wayne, N.J. 07470**
**Filed June 26, 1972, Ser. No. 266,079**
**Int. Cl. A63b** *53/02, 53/04*
**U.S. Cl. 273—80 C** **5 Claims**




A golf club of the putter type has a head with a relatively small impact area and lateral extensions thereof which form deflected balance wings. The impact area of the head contains perforations forming air passages to minimize the air cushion at the moment of impact and to reduce the mass density in the impact area. Deflected balance wings and an alignment bar assist in alignment of putter face to the ball.

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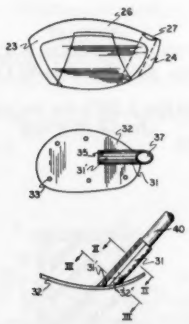
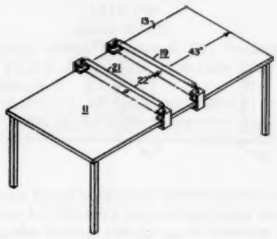
**3,819,181**
**HOSEL-LESS WOOD TYPE GOLF CLUB**
**Truett P. Mills, 1700 Second Ave., Tuscaloosa, Ala. 35211**
**Division of Ser. No. 74,656, Sept. 23, 1970, Pat. No. 3,759,517. This application Sept. 18, 1972, Ser. No. 289,849**
**Int. Cl. A63b** *53/02*
**U.S. Cl. 273—80.2** **12 Claims**



A wood type golf club having a club head with a frontal striking surface, toe and heel portions, a bottom surface, and a top surface, the club head having a shaft receiving opening in the top surface at said heel portion and said top surface being a continuation of the general contour of the club head from the toe to the heel portions. The club head is provided on its bottom surface with a sole plate which is associated with a shaft retainer that is received in the shaft receiving opening in the club head. A shaft is received in the shaft retainer and secured therein.

**3,819,182**
**TABLE TENNIS TABLE HAVING TWO BARRIERS DEFINING AREAS MOUNTED THEREON**
**Alfred E. Lersch, 130 Washington Rd., Forest Hills, Pa. 15221**
**Filed Oct. 4, 1972, Ser. No. 294,817**
**Int. Cl. A63b** *71/02*
**U.S. Cl. 273—95 R** **5 Claims**



There is disclosed a table game which may be played on a table similar to that employed in a table-tennis game. The surface of the table has at its ends areas or zones which are marked-off or otherwise defined and which are separated by an area or zone in the center. There are barriers at the boundaries of each end area and the center area. The game is played by opponents, each stationed adjacent an end area, who stroke a ball across the table over the barriers. The ball is a relatively large ball, about three or four inches in diameter and of soft rubber or foam. Each opponent may stroke the ball before it bounces twice on the area on his side. The purpose of the game is to project or stroke the ball into the area on the opposite side without projecting the ball into the center zone or committing a "fault" such as projecting the ball off the table or having it deflected back by a barrier. If the ball is projected into the center zone between the barriers, the player who so projects the ball suffers a penalty which is higher than the penalty for a "fault."

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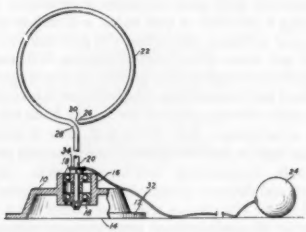
**3,819,183**
**PROJECTILE TETHERED TO ROTATABLE TARGET HOOP**
**William E. Crowder, P.O. R.D. 1, Mt. Wolf, Pa. 17347**
**Filed Oct. 18, 1971, Ser. No. 190,046**
**Int. Cl. A63b** *71/00*
**U.S. Cl. 273—98** **2 Claims**

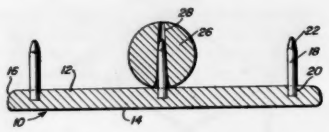


Game apparatus adapted to be played outdoors or indoors and including a shaft rotatably mounted at one end in a bearing of a base member either resting upon a horizontal playing surface or suspended from a ceiling. A target loop is provided on the other end of the shaft and one end of a flexible tether is looped or otherwise loosely connected to said shaft while a ball-like projectile is connected to the other end of the tether for projection to and through said target loops such as by kicking, pitching or otherwise.

## 3,819,184
## BOARD GAME APPARATUS

William B. McPhail, and Hazel M. McPhail, both of 48 Oakley Way, New Port Richey, Fla. 07470

Filed Apr. 18, 1973, Ser. No. 352,478
Int. Cl. A63f *3/00*
U.S. Cl. 273—131 BA 5 Claims

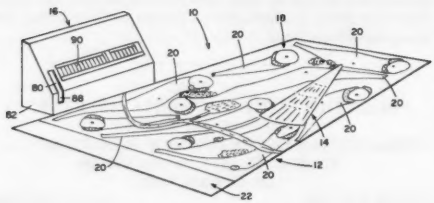



A game device which includes a board having a substantially planar upper surface and a plurality of upwardly projecting pegs oriented in an equally spaced relationship on the board for receiving balls having sockets or recesses therein whereby the balls may be positioned on and moved from peg to peg in a prescribed manner for playing a game with the size and shape of the balls being such that to properly manipulate the balls, the players of the game will exercise their fingers which is especially helpful when a person has an arthritic condition which can be alleviated by manipulation of the balls.

## 3,819,185
## SIMULATED GOLF GAME

Robert C. Lowther, 1919 Andrews St., Alexandria, La. 71301

Filed Nov. 21, 1972, Ser. No. 308,604
Int. Cl. A63f *3/02*
U.S. Cl. 273—134 CG 14 Claims

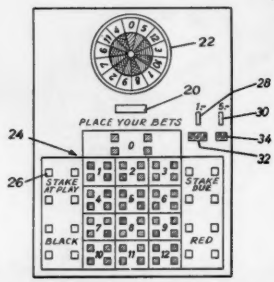



A simulated golf game includes a simulated golf course comprising a plurality of golf holes, a direction and distance plotter, and a chance apparatus. The golf holes include a plurality of par three holes each extending full length from a green portion through a fairway portion to a tee portion, and a plurality of par four and par five holes each including a green portion and a fairway portion extending from the green portion to a truncated end. Each golf hole is provided with reference indicia, and the direction and distance plotter is provided with cooperating reference indicia, whereby the direction and distance plotter is correctly aligned relative to the golf holes. The chance aperature comprises a drum defining a series of axially spaced rings each corresponding either to a particular golf shot or a type of golf shot. The rings of the drum are in turn divided into a series of circumferentially extending segments each designating either a direction and distance on the plotter or the result of the golf shot. By this means the chance apparatus cooperates with the distance and direction plotter to determine the path of each player over each golf hole. The simulated golf course is disposed on the opposite sides of a flexible playing surface having outer surfaces formed from a plastic material, whereby the path of each player may be indicated with a colored pencil, etc. and the playing surface may be cleaned prior to reuse.

## 3,819,186
## AUTOMATIC ELECTRONIC GAMING MACHINE OF THE ROULETTE TYPE

Adolf Hinterstocker, Roggersdorf, Germany, assignor to Gunter Wachtler, Rottach-Egern, Germany

Filed June 7, 1972, Ser. No. 260,364
Claims priority, application Germany, Sept. 15, 1971, 2146096
Int. Cl. A63f *5/00*
U.S. Cl. 273—138 A 23 Claims

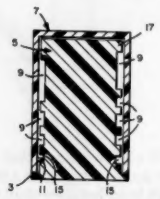



An electronic automatic roulette game having a simulated number cup and a simulated revolving ball. A game board includes a plurality of numbers corresponding to the numbers on the cup and further subdivided into various color fields and high and low number groups any of which a player can bet a stake on. The cup includes a plurality of lights which are energized in succession under control of an oscillator to simulate the revolving ball, each light corresponding to one of the colored numbers. A counting unit and stake bet computer circuit automatically ascertain when the amount of the stake selected by the player to be bet has been fully paid by the player and cooperate to bring the oscillator to rest, thus stopping rotation of the simulated ball. A win determining circuit compares the number, color, or high and low numbers selected by the player to the colored number position of the simulated ball to determine any correspondence which correspondence controls the pay out.

## 3,819,187
## CONCEALED MAZE PUZZLE

George W. Downs, 5508 Don Rodolfo Ct., San Jose, Calif. 95123

Filed Feb. 5, 1973, Ser. No. 329,738
Int. Cl. A63f *9/08*
U.S. Cl. 273—156 3 Claims




A concealed maze puzzle traversable by sense of touch alone is disclosed. A maze puzzle having depressions of limited depth is provided on the outer surface of a cylinder, the cylinder having a circular base of greater diameter than the cylinder. A can-shaped cover, one end of the can being open, fits over the maze puzzle. The cover is opaque. The can-

like cover has a short nub interiorly near but not at the open end thereof. The base is generally made large enough in diameter so that due to the combination of the shortness of the nub, the limited depth of the depressions of the maze, the placement of the nub, and the extension of the diameter of the circular base beyond that of the cylinder one cannot observe the position of the nub as it traverses the maze. The nub is guided through the maze by grasping the base in one hand and the cover in the other. Only a single exit is provided at the top of the maze.

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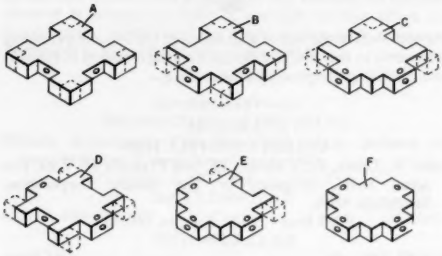
**3,819,188**
**SECTIONED SHELL PUZZLES**

**Gerald Allen Freedman, P.O. Box 503 Federal Station, Worcester, Mass. 01601**

**Filed Dec. 29, 1972, Ser. No. 319,475**
**Int. Cl. A63f** *9/12*
**U.S. Cl. 273—160** **9 Claims**




A plurality of pieces constitute the normal edge dissection of a polyhedron shell. Selections of said pieces can be used to reconstruct the shell perfectly. Male and female keys along the edges of each piece interfit to form the edges and corners of the shell perfectly. Cubic and tetrahral shells are illustrated. Selected pieces can be used to construct variously shaped shells. The pieces may be provided with binding holes through which binding pins may be inserted to hold adjacent pieces together.

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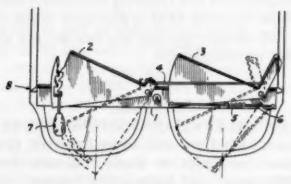
**3,819,189**
**GOLF TRAINING AIDS**

**Rexford Fenton Goode, 901½ N.W. 18th St., Oklahoma City, Okla. 73106**

**Filed Oct. 4, 1973, Ser. No. 403,558**
**Int. Cl. A63b** *69/36*
**U.S. Cl. 273—183 B** **3 Claims**




This application discloses a golfer's training aid wherein a pair of opaque shutters are pivotally secured to a frame for a pair of eyeglasses. A resilient member is provided to provide a force for moving the shutters to a position obscuring the user's normal line of sight. A pivotal plumb bob coacts with one shutter and the frame to maintain both shutters above the user's normal line of sight. A ratchet-like mechanism on one shutter coacts with the plumb bob and allows both shutters to be moved downward, edgewise, in successive stages, in response to successive relative movements of the plumb bob, caused by movements of the golfer's head and frame during a putting stroke.

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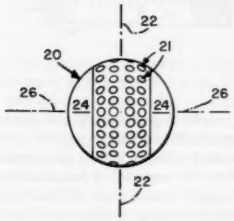
**3,819,190**
**GOLF BALL**

**Daniel A. Nepela, 18960 Fernbrook Ct., Saratoga, Calif. 95070, and Fred E. Holmstrom, 6520 Falls River Dr., San Jose, Calif. 95120**

**Filed Oct. 2, 1972, Ser. No. 294,363**
**Int. Cl. A63b** *37/14*
**U.S. Cl. 273—232** **5 Claims**




A golf ball having controllable flight characteristics and comprised of a standard sized spherical body with surface depressions located in a band extending therearound and the surface portions outside this band having fewer, or no, depressions to decrease the drag on the ball while leaving the lift characteristics substantially the same thereby to cause the ball, for a given striking force, to exhibit directional control.

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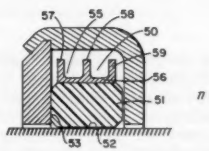
**3,819,191**
**SEALING RING ASSEMBLY FOR ROTARY FACE SEAL**

**Robert M. Voitik, Glenview, Ill., assignor to Innovatex Corporation, Glenview, Ill.**

**Filed June 26, 1972, Ser. No. 266,451**
**Int. Cl. F16j** *15/40*
**U.S. Cl. 277—22** **4 Claims**

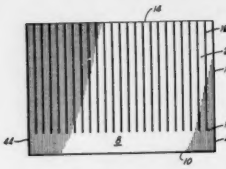



A sealing ring assembly for cooperation with a rotatable shaft and a mating ring to provide a rotary face seal, the assembly comprising a sealing ring having inner cylindrical and lateral flat sealing surfaces possessing a high degree of smoothness, and a stabilizing ring snugly engaging the outer cylindrical surface of the sealing ring. The stabilizing ring has integral circumferential fin means which reinforce the ring so as better to resist centrifugal and thermal expansion forces tending to distort the cylindrical and flat sealing surfaces of the sealing ring. The fin means also serves as a heat dissipating mechanism, thereby effectively reducing the distorting forces resulting from thermal expansion.

### 3,819,192
### WELL PRESSURE SEALING CUP REINFORCING STRUCTURE AND METHOD OF MANUFACTURE

Robert F. Berry, 10318 Church Rd., Dallas, Tex. 75238, and Henry W. Blackwell, Rt. 1, Venus, Tex. 76084

Division of Ser. No. 166,171, July 26, 1971, Pat. No. 3,722,053. This application Jan. 8, 1973, Ser. No. 321,621
Int. Cl. F16j 9/08
U.S. Cl. 277—212 C 7 Claims



An improved reinforcing structure and method of making said structure are disclosed. The improved reinforcing structure is a polyfurcated cylinder having an integral base portion and a tines portion. The method of manufacture includes the steps of rolling a polyfurcated plate with an integral base and tines portion, rolling the base portion into a cylindrical shape and securing the abutting ends of the base.

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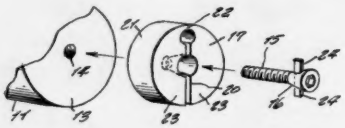
### 3,819,193
### QUICK SPLIT ARBOR

George S. Kyriakou, 99-42 41 Ave., Corona, N.Y. 11368

Filed Jan. 17, 1973, Ser. No. 324,370
Int. Cl. B23b 31/42
U.S. Cl. 279—2 R 3 Claims



An improved arbor having a novel means for securely holding a work in a lathe or other machine, in a quicker manner without necessity of using a chuck wrench, set screw or nut; the device consisting of an arbor member securable at one end in a machine chuck, the other end having a removable split chuck member receivable into a central opening of the work and which is readily expandable therewithin for holding thereto.

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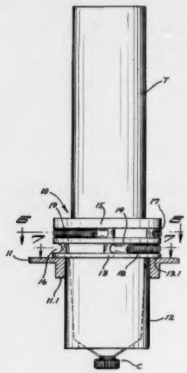
### 3,819,194
### TUBE HOLDER

John J. Grevich, Star Prairie, and John J. Gardetto, Hayward, both of Wis., assignors to Domain Industries, Inc., New Richmond, Wis.

Filed Oct. 16, 1972, Ser. No. 297,816
Int. Cl. B65d 35/56
U.S. Cl. 279—23 10 Claims

A device for holding tubes constructed of flexible and collapsible metallic foil, during filling of the tube with paste-like material, the device including a rigid sleeve with a supporting shoulder at the bottom and an oblong interior configuration at the top, slots in the sleeve wall adjacent the top and extending transverse to the axis, and elongate spring retainers in the slots and extending peripherally of the sleeve.



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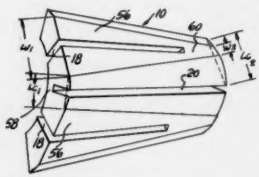
### 3,819,195
### COLLET CONSTRUCTION

John W. Lehde, Jr., Chicago, Ill., and Prabodh M. Vora, Gujarat, India, assignors to The Bendix Corporation, Southfield, Mich.

Filed June 7, 1972, Ser. No. 260,564
Int. Cl. B23b 31/20
U.S. Cl. 279—46 4 Claims



A collet construction is described for split sleeve, single angle, outside taper straight bore type collets which provides a more nearly uniform closing action over a range of bore diameters for collet sizes such that the gripping length is less than the full length of the collet. This construction involves locating both the front and rear sets of ties joining the slots within the gripping length of the collet as long as the flexibility requirements allow, and in situations in which such a configuration is impractical due to a resulting excessively stiff collet, a tapered relief on the collet O.D. is provided which creates an even closing rate despite the fact the ties are not all located within the collet gripping length.

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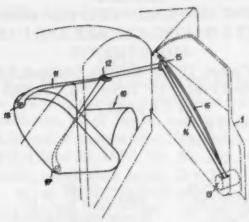
### 3,819,196
### AUTOMATIC SAFETY HARNESS CONTROL SYSTEM

Pierre Bouthors; Alain Dera, and Andre Lefeuvre, all of Billancourt, France, assignors to Regie Nationale Des Usines Renault, Billancourt and Automobiles Peugeot, Paris, both of, France

Filed Aug. 31, 1972, Ser. No. 285,218
Int. Cl. B60r 21/10
U.S. Cl. 280—150 SB 6 Claims

This device for automatically tensioning and releasing a safety harness is responsive to the opening and closing movements of a door of the vehicle.

It comprises a safety harness, a pair of anchoring points thereof, disposed at different levels, at least one point being adjustable, said anchoring points being spaced laterally from the adjacent door of the vehicle, a buckle adapted to slide along said harness, a traction element secured to said buckle,



a winder for said traction element, a first guide member rigid with the door and a second guide member movable in relation to said first member and guided thereby, wherein the traction element is adapted to exert a constant tractive effort on second guide member and the winder is secured in a manner known per se to a suitable part of the vehicle.

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**3,819,197**

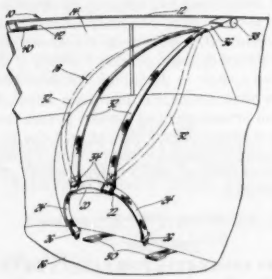
**SEMIRIGID SHOULDER BELTS**

**Horacio Shakespear, West Bloomfield, Mich., assignor to General Motors Corporation, Detroit, Mich.**

**Filed Dec. 5, 1972, Ser. No. 312,334**

**Int. Cl. B60r** *21/10*

**U.S. Cl. 280—150 SB** **3 Claims**



A vehicle occupant restraint belt arrangement includes a movable lap belt retractor housing with a pair of flexible end portions through which belt ends of a lap belt are extendable for movement from a stored position to a restraining position extending across an occupant's lap so as to restrain the lower torso portion. A pair of semirigid shoulder belts have lower ends respectively looped over the flexible end portions of the movable retractor housing. An inertia retractor mounted on the associated vehicle roof receives a control belt whose free end is attached to the upper ends of the shoulder belts such that they are adaptable to extend downwardly from the roof on each side of the occupant's head so as to restrain the upper torso by engagement with the occupant's shoulders. The end portions of the movable retractor housing are flexed to move the shoulder belts away from each other to outwardly bowed positions where they are clear of the occupant's head during movement to and from the restraining position. A resilient member mounted on a forward portion of the roof selectively attaches the movable lap belt retractor housing by a snap action so that the shoulder belts extend along the roof in a manner defining a storage position of the belt arrangement.

**3,819,198**

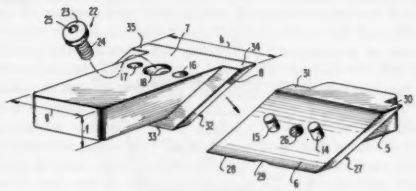
**SEGMENTED SKI APPARATUS INCLUDING ANTIVIBRATION COUPLING MEANS**

**Harold W. Groves, 5200-San Mateo N.E., Alburquerque, N. Mex. 87109**

**Filed Apr. 23, 1973, Ser. No. 353,617**

**Int. Cl. A63c** *5/02*

**U.S. Cl. 280—11.13 K** **6 Claims**



A segmented ski apparatus including a plurality of ski segments, each having mounting block means. Two adjacent ski segments are provided with mutually contiguous, mounting block means which are interconnected by antivibration coupling means. This antivibration mounting means includes spaced, mounting block contact zones which are separated by concavity means. A locking means extends between the mounting block means to secure the ski segments in coupled, vibration resistant, assembly, substantially retaining the flexural characteristics of a normal, one-piece ski.

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**3,819,199**

**SKI BINDING**

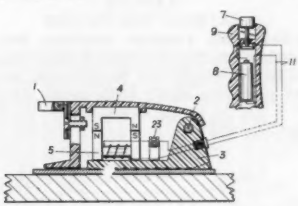
**Thomas Gordon Smolka, Wien-Mauer, and Gottfried Schweizer, Wien, both of Austria, assignors to Gertsch AG, Zug, Switzerland**

**Filed Apr. 10, 1972, Ser. No. 242,528**

**Claims priority, application Austria, Apr. 22, 1971, 3455/71**

**Int. Cl. A63c** *9/08*

**U.S. Cl. 280—11.35 M** **13 Claims**

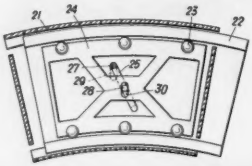


Ski binding adapted for emergency release. A ski binding is provided with a pair of mechanical parts which are arranged to separate during release of the binding. A permanent magnet is affixed to one of said parts and an electromagnet is affixed to the other thereof, the electromagnet being energizable either at the will of the skier or by remote control. Same is energized under normal skiing conditions and holds the binding closed with a relatively high level of force which can be overcome under emergency conditions to effect release of the binding. However, if a condition of danger is anticipated, the electromagnet can be de-energized, whereupon the holding force remaining is only that of the permanent magnet and the holding force thereupon is reduced to a lesser level. This, while not opening the bindings, makes it possible for same to open under the impact of a lesser opening force. Control of the electromagnet may be manually in response to a switch controlled by the skier or by remote control, such as impulses received from a transmitter which in turn is responsive to biochemical electrical impulses derived from the muscles of the skier.

## 3,819,200
## SOLE SUPPORT DEVICE

**Gottfried Schweizer, Vienna, and Thomas Gordon Smolka, Vienna-Mauer, both of Austria, assignors to Gertsch AG, Zug, Switzerland**

**Filed May 22, 1972, Ser. No. 255,849**
**Claims priority, application Austria, June 23, 1971, 5433/71; July 16, 1971, 6185/71**
**Int. Cl. A63c 9/00**
**U.S. Cl. 280—11.35 C** **10 Claims**




The invention is applicable to a low friction device for mounting on a ski and permitting low friction sideward movement of a boot supported thereon. Such a device is provided with a base plate that is mounted on the ski and a stepping plate which supports the boot. The device has friction devices, such as a ball and cage structure interposed between said plates to permit low friction sideward movement of the stepping plate with respect to the base plate. A lever is pivotally mounted on the cage at a point intermediate its ends and has one end thereof pivotally engaging the base plate and the other end thereof pivotally engaging the stepping plate. Thus, as the stepping plate is caused to move sidewardly with respect to the base plate the pre.ence of the lever insures that the ball carrying cage will also move sidewardly a predetermined portion of the distance so moved by the stepping plate. Normally such movement of the cage is one-half the movement of the stepping plate with respect to the base plate.

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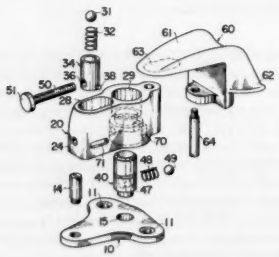
## 3,819,201
## SKI BOOT TOE FIXTURE

**Tokutaro Iizuka, and Yoshinari Mochizuki, both of Tokyo, Japan, assignors to Hope Kabushiki Kaisha, Tokyo, Japan**

**Division of Ser. No. 93,232, Nov. 25, 1970, Pat. No. 3,733,085. This application Mar. 2, 1973, Ser. No. 337,629**
**Int. Cl. A63c 9/08**
**U.S. Cl. 280—11.35 T** **2 Claims**




A ski boot toe fixture comprises a base adapted to be fixed on the upper surface of a ski, a turnable member holding a ski boot toe, a press connecting means connecting the base and the turnable member by resilient pressure, a boot toe holding top covering member and a second press connecting member connecting the boot toe holding member and the turnable member. The turnable member is arranged on the base to turn relative to the base around a vertical pin. The ratio of the space between the vertical pin and the second press connecting means to the space between the boot toe and the vertical pin is adjustable by an adjusting means.

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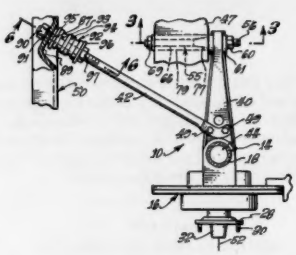
## 3,819,202
## INDEPENDENT SUSPENSION SYSTEM FOR A MOTOR VEHICLE HAVING CAMBER AND CASTER ADJUSTMENTS

**John Herman Castoe, 10234 McVine, Sunland, Calif.**

**Filed Feb. 2, 1972, Ser. No. 222,860**
**Int. Cl. B62d 17/00**
**U.S. Cl. 280—96.2 B** **14 Claims**




The present invention relates generally to automotive suspensions systems adapted to support a steerable wheel hub assembly in a preset relation with respect to the frame of the vehicle. More particularly, there is disclosed apparatus which constitutes a modification of a factory preset suspension system of the general type which includes an independent coil spring mounted about elongated telescoping struts, compression and transverse links, all of which are mounted for limited rotational movement with respect to the frame and provide, in their known form fixed camber and caster setting of the wheel hub assembly with respect to the frame. The invention herein particularly describes means for providing adjustability in such a suspension arrangement to thereby permit compensation to be made as required from time to time due to such inevitable occurrences as changes in vehicle load, distribution of that load, front-end damage, metal fatigue, wheel offset, tire wear and configuration.

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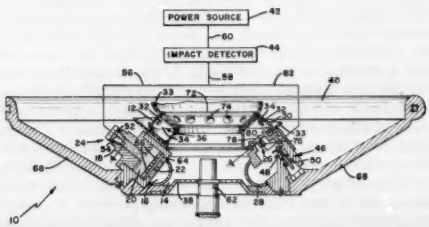
## 3,819,203
## INFLATION APPARATUS FOR SAFETY DEVICE

**Donald G. Radke, Rochester, and Robert L. Stephenson, Sterling Heights, both of Mich., assignors to Allied Chemical Corporation, New York, N.Y.**

**Filed Mar. 29, 1972, Ser. No. 239,065**
**Int. Cl. B60k 21/08**
**U.S. Cl. 280—150 AB** **12 Claims**




A safety apparatus for vehicle passengers comprising a plurality of gas producing components in communication with a

substantially annular inflatable bag. Gas is delivered from the gas producing components into the bag upon receipt of an electrical current from an impact detecting means responsive to impact of a vehicle in which the apparatus is disposed. The bag can be disposed around the hub of the vehicle's steering wheel so as to provide for continuous access to the hub, and inflates to produce a stronger bag than results when a spherical bag having the same volume is inflated.

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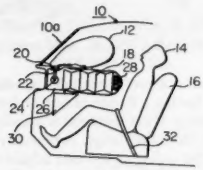
**3,819,204**

## SAFETY DEVICE FOR MOTOR VEHICLE

**Takashi Oka, Tokyo; Tatsuhiro Arima, and Akira Kimitsuka, both of Yokohama, all of Japan, assignors to Nissan Motor Company Limited, Kanagawa-ku, Yokohama City, Japan**

**Filed June 30, 1972, Ser. No. 268,209**
**Claims priority, application Japan, Oct. 26, 1971, 46-98579**
**Int. Cl. B60r** *21/08*
**U.S. Cl. 280—150 AB** **1 Claim**




A safety device for use in a motor vehicle for protecting a vehicle occupant from injury during a collision of the motor vehicle, which safety device comprises an instrument panel forming a part of the motor vehicle and deformable to absorb the energy of the vehicle occupant when the vehicle occupant impacts against the instrument panel during the collision of the motor vehicle, and an inflatable protector bag located on the instrument panel and expansible to its protective position to provide a restraint to limit forward movement of the head of the vehicle occupant.

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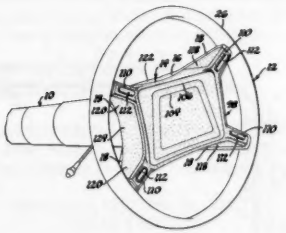
**3,819,205**

## MODULAR OCCUPANT RESTRAINT SYSTEM

**Sidney G. Dunford, and James R. Weaver, both of Dayton, Ohio, assignors to General Motors Corporation, Detroit, Mich.**

**Filed Sept. 25, 1972, Ser. No. 291,698**
**Int. Cl. B60r** *21/08*
**U.S. Cl. 280—150 AB** **14 Claims**



A vehicle steering wheel includes a generally rectangularly shaped dished hub connected to a rim by four offset spokes extending generally from the corners of the hub. A generally rectangularly shaped support plate generally coextensive with the hub opening includes a central aperture and four offset extensions which overlie the spokes of the wheel. Offset lateral tabs from the support plate extensions seat on apertured embossments of the hub and are bolted thereto from the lower side of the hub. A gas generator fits between the support plate and hub and is bolted to the lower side of the plate. The outlet of the generator projects through the support plate opening. A diffuser overlies the generator outlet and is bolted through the open end of an inflatable cushion to the support plate with the gas generator. A rectangularly shaped container covers the support plate, the cushion and the diffuser. The container includes an H-shaped weakened line and extensions which overlie the support plate extensions. An outer decorative flexible closure covers the container and extensions and includes an H-shaped weakened line generally corresponding to that of the container. The closure is commonly secured with the container to the lower side of the support plate and seats on the hub opening. A conductor includes arms which overlie the container extensions and underlie discrete flexible finger depressible portions of the closure. Foam pads space the arms from ground clips which are secured to the container extensions and seat on the support plate. Upon depression of the pads the arms of the conductor complete the circuit to blow the horn. When the gas generator is actuated by a suitable sensor, the pressure fluid generated flows through the diffuser to inflate the cushion. The cushion is deployed through the container and closure as the weakened lines thereof are ruptured to provide flaps. Likewise the conductor is preweakened to rupture and not interfere with cushion deployment.

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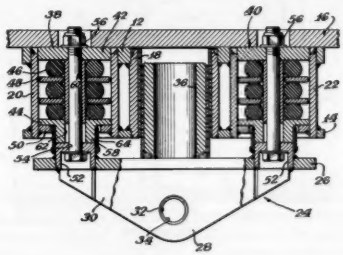
**3,819,206**

## CUSHION HITCH

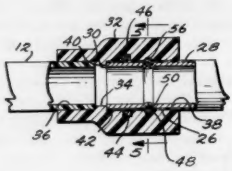
**Geoffrey L. Aarons, Lake Forest, and Ralph M. De Weese, Antioch, both of Ill., assignors to International Harvester Company, Chicago, Ill.**

**Division of Ser. No. 251,867, May 10, 1972. This application Aug. 16, 1973, Ser. No. 388,846**
**Int. Cl. B60d** *1/16;* **F16f** *7/12*
**U.S. Cl. 280—487** **3 Claims**



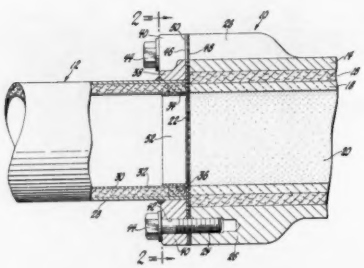

A cushion hitch for a vehicle capable of cushioning both push and pull loads having a housing affixed to the vehicle with a central guide tube and a pair of chamber tubes on either side thereof. A spring assembly is positioned in each of the chamber tubes and includes front and rear plates separated by a plurality of elastomer toriods with interleaved metal washers with stops to prevent the plates from exiting from the respective tubes. A hitch adapter is provided with means for pushing the front plates toward the rear plates under push loads imposed on the adapter and means for pulling the rear plates toward the front plates under pull loads. Various spring rates and maximum operating loads can be varied by varying the size and number of toroids with spacer rings being utilized to maintain the smaller toroids with larger central openings centered and aligned within the chamber tubes.

3,819,207
METER RISER ASSEMBLY
Wilbur R. Leopold, Jr., Decatur, Ill., assignor to Mueller Co., Decatur, Ill.
Filed Feb. 5, 1973, Ser. No. 329,335
Int. Cl. F16l 55/00
U.S. Cl. 285—45 10 Claims



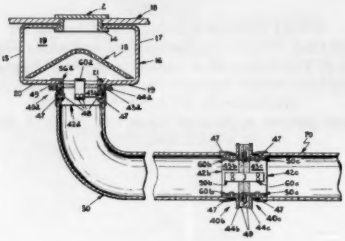
A meter riser assembly for use in connecting a fluid meter with a plastic service line, the meter riser assembly including a plastic transition body fitting bonded to the plastic service line, and a metal pipe adapted for connection at one end to the meter and at the other end to the body fitting, the metal pipe being coated with a corrosive resistant coating to protect it from weather and ground elements. An O-ring provides a seal between the exterior of the coated metal pipe and the interior of the body fitting whereas a flexible rod made of softer material than the pipe coating is inserted through a hole in the fitting into a groove between the fitting and the pipe for retaining the pipe in the fitting while permitting relative rotation between the members.

3,819,208
INSULATED EXHAUST PIPE CONNECTION
Werner Janle, Pontiac, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Nov. 24, 1972, Ser. No. 309,137
Int. Cl. F16l 23/00, 59/00
U.S. Cl. 285—47 2 Claims



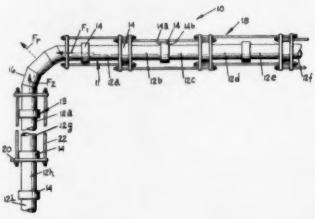
Means for connecting an insulated exhaust pipe to an exhaust transmitting member such as an insulated manifold reactor. In a preferred embodiment, the connection includes an outer flange fixed to the outer shell of the exhaust pipe and secured to the housing of the reactor and a thin sheet metal inner flange clamped between the exhaust pipe and outer flange and the reactor. The inner flange includes a tubular portion extending within the exhaust pipe and covering the gap provided to permit relative expansion of the inner exhaust pipe liner under operating temperatures. A high temperature seal ring and a gasket engage opposite sides of the sheet metal inner flange to prevent exhaust leakage through the connection and into the insulating materials of the connected members.

3,819,209
DUCT CONNECTOR
Charles B. Anderson, Spring Lake, and William H. Tuggle, Jr., Nunica, both of Mich., assignors to Atco Rubber Products, Inc., Grand Haven, Mich.
Filed June 2, 1972, Ser. No. 259,012
Int. Cl. F16l 5/02
U.S. Cl. 285—73 12 Claims



A universal duct connector includes a collar made of flexible material and having a flange at one end thereof extending around its periphery. Duct material is attached to the end of the collar remote from the flange. A plurality of coupling ears are mounted to the collar at the end adjacent the flange and spaced around the periphery of the collar. Each of the ears includes a tab portion extending outwardly, spaced above, and approximately parallel to the surface of the flange. Alternate coupling ears include slotted apertures to receive tabs shaped in conformity with the tabs of remaining alternately spaced ears such that two connectors can be interconnected to form a sealed joint. A single connector can be employed to couple an end of a duct to a heating apparatus by employing the tabs of each coupling ear as holding flanges which are coupled over the edge of a duct receiving aperture in the heating apparatus. In both uses, a foam polymeric material can be attached to the face of the collar flange to insure an air-tight seal.

3,819,210
METHOD AND ASSEMBLY FOR CONTROLLING THRUST FORCES IN A PIPE ARRANGEMENT
Leonard Irving Daniel, Flagtown; Thomas H. Sadler, Belle Mead, both of N.J.; John F. Nawn, Denver, Colo., and David Walter French, Denison, Tex., assignors to Johns-Manville Corporation, Greenwood Village, Colo.
Filed May 8, 1972, Ser. No. 251,215
Int. Cl. F16l
U.S. Cl. 285—114 9 Claims



An assembly for and method of controlling the internal thrust forces in a pressurized fluid conveying pipe arrangement, including a plurality of pipe sections interconnected by coupling members, is disclosed herein and utilizes a plurality of support plates or plate members and interconnecting rods.

One of the support plates is disposed around and rigidly secured to a predetermined pipe section, specifically the valve, tee, elbow or other such direction-changing, thrust-creating fitting, when the latter is used. The remaining plates are respectively disposed around selected ones of the remaining pipe sections, and respectively positioned in abutting relationship with the ends of preselected coupling members. The plates, including the rigidly secured plate, are interlocked together by a plurality of axially extending rods which prevent the plates from moving relative to one another. In this manner, those pipe sections positioned between the end most support plates are restrained from moving relative to the aforestated predetermined pipe section so as to restrain those individual sections from otherwise uncoupling from one another in response to internal thrust force caused by the conveyed pressurized fluid.

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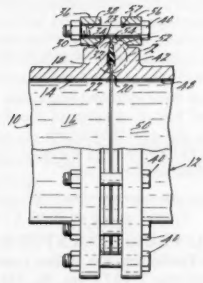
**3,819,211**
**CONVEYOR SYSTEM**

**Harold L. Knox, Grosse Isle, Mich., assignor to Detroit Stoker Company, Monroe, Mich.**

**Continuation of Ser. No. 140,490, May 5, 1971, abandoned. This application Mar. 26, 1973, Ser. No. 344,894**
**Int. Cl. F16l** *23/00*
**U.S. Cl. 285—336** **2 Claims**



This disclosure pertains to a seal assembly, which includes a sealing member having a primary and secondary sealing surface, which is adapted to provide a fluid tight joint between a pair of connecting members in a piping conveyor system and which increases in sealing effect in response to increases in internal pressure. The sealing member is adapted to be interposed between confronting surfaces of the connecting members and supported in complementary grooves therein to provide a piping joint having improved capabilities to withstand severe shock loads, hydraulic hammer, or the like.

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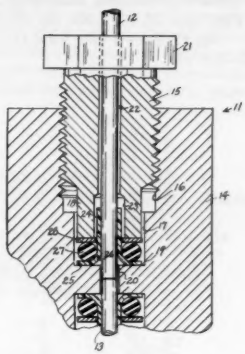
**3,819,212**
**FLARED FERRULE TUBE END FITTING**

**Peter A. St. John, Adelphi, and Herbert Goldsmith, Rockville, both of Md., assignors to Baxter Laboratories, Inc., Morton Grove, Ill.**

**Filed Jan. 5, 1973, Ser. No. 321,279**
**Int. Cl. F16l** *17/00*
**U.S. Cl. 285—356** **10 Claims**

A fitting assembly for joining small-diameter tubing to other tubing or to various other fittings or fixtures. The assembly consists of a threaded bushing of metal or plastic, a stainless steel washer, an elastomeric O-ring, and a deformable flared ferrule. The unaltered tubing extends through the bushing, washer, O-ring and ferrule. The assembly is screwed into a threaded port coupling or fitting with a flat bottom. Sealing is accomplished by the pressure of the constrained O-ring, forcing the flared ferrule against the bottom of the port, and similarly, the radial pressure of the O-ring seals the ferrule to



the tubing wall, deforming the tube slightly. The stainless steel washer serves to constrain the O-ring and to decouple the torque exerted by the bushing.

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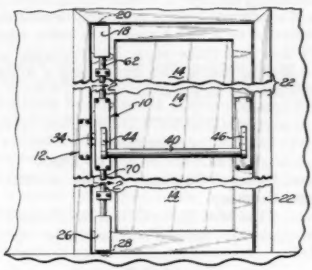
**3,819,213**
**EXIT DEVICE**

**George William Vanderburgh, Somers, N.Y., assignor to Eaton Corporation, Cleveland, Ohio**

**Filed Sept. 29, 1972, Ser. No. 293,430**
**Int. Cl. E05c** *9/04, 15/02*
**U.S. Cl. 292—21** **12 Claims**

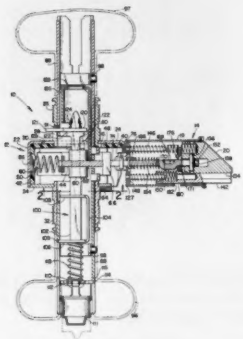


An improved exit device can be used with a door having anyone of a plurality of latch arrangements including a vertical latch arrangement with latch assemblies at the top and bottom of the door, a lateral latch arrangement with a latch assembly near the center of the door, and a combination vertical and lateral latch arrangement. In addition, the exit device can be associated with latch assemblies which are either concealed within the door or mounted on the surface of the door. The exit device includes a channel shaped slide member which is adapted to be connected with vertical and/or lateral latch assemblies. When a crossbar is depressed, the slide member is moved along a vertical path to actuate the associated latch assemblies from an engaged condition to a disengaged condition. The slide member can also be moved by a suitable outside actuator, such as a thumbpiece or knob. The exit device is advantageously provided with a holdback or dogging cam which is rotated to hold the slide member in a position in which the latch assemblies are disengaged. In addition, the exit device may be provided with a deadlatching dog which is operated from a locking position to a release position as the crossbar is depressed.

## 3,819,214
## CYLINDRICAL LOCK SET

**Le Roy Hart, West Hartford; Thomas R. Salonia, Kensington, both of Conn., and Gary R. Bergen, Yorba Linda, Calif., assignors to Emhart Corporation, Bloomfield, Conn.**

**Filed Sept. 26, 1972, Ser. No. 292,346**
**Int. Cl. E05b** *55/00;* **E05c** *1/12*
**U.S. Cl. 292—169.13** **33 Claims**



A cylindrical lock set including an operating unit having a cylindrical housing containing a unitary retractor frame of non-metallic, low-friction material supporting a unitary metallic retractor slide. A latch unit releasably connected to the operating unit includes a case supporting a latch bolt releasably connected to the retractor slide by a female tailpiece. Coengageable cam surfaces on the tailpiece and on a deadlocking member carried by the latch bolt positively drive the deadlocking member to a deadlocking position relative to the case if an attempt is made to forcibly depress the latch bolt as by insertion of a tool between the outer edge of an associated door and strike plate. The operating unit also includes a locking mechanism for locking a rollback against rotation relative to the housing.

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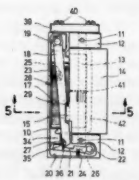
## 3,819,215
## ELECTRIC DOOR OPENER

**Fritz Fuss, Ebingen, Germany, assignor to Fritz Fuss K.G., Ebingen, Germany**

**Filed Mar. 31, 1972, Ser. No. 239,943**
**Claims priority, application Germany, Apr. 5, 1971, 2116637**
**Int. Cl. E05b** *47/02*
**U.S. Cl. 292—201** **4 Claims**



In an electric door opener there is provided a housing, a swinger latch pivotally held in said housing and extending outwardly therefrom to engage a complemental recess in the door jamb, a pivotal locking lever spring-urged into a position in which it locks the swinger latch, a pivotal detent lever spring-urged into a position in which it immobilizes the locking lever in its locking position and an electromagnet including a solenoid that has an axis extending in the longitudinal direction of the housing and an armature which, when the solenoid is energized, moves the detent lever into its releasing position.

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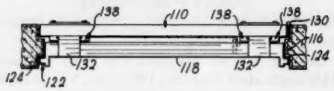
## 3,819,216
## BURGLAR BAR FOR OUTSWING DOOR

**Rolf Price Richardson, Linwood, Kans., assignor to Maverick Industries, Incorporated, Linwood, Kans.**

**Filed Feb. 26, 1973, Ser. No. 335,730**
**Int. Cl. E05c** *19/18*
**U.S. Cl. 292—259** **15 Claims**




A burglar bar is provided which prevents both ingress and egress from an outswinging single or double door. It comprises an elongated, unitary bar mounted solely on the inside of the door in spanning relationship thereto, with no mounting structure of any kind being required on the circumscribing door frame. The bar includes stop structure on the distal ends thereof which precludes outward movement of the door even when the separate door lock and hinge pins are removed during an attempted forced opening of the door. Additionally, mounting means are provided which prevents the bar from being twisted or pried free from the door, thus enhancing the overall security function of the bar.

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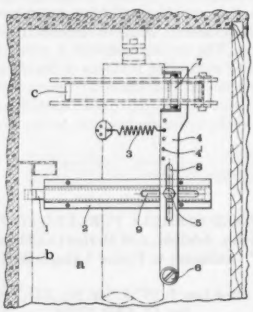
## 3,819,217
## AUTOMATIC LOCKING DEVICE FOR ROLLER BLINDS

**Italo Savino, Via Emilia ang. Via Molise, Latina, Italy**

**Filed May 2, 1973, Ser. No. 356,337**
**Claims priority, application Italy, May 13, 1972, 609/72**
**Int. Cl. E05c** *1/06*
**U.S. Cl. 292—345** **5 Claims**

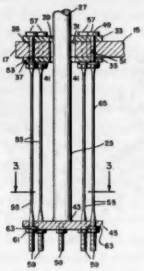



An automatic locking device for roller blinds, comprising a locking bolt movable under the action of a spring into engagement with the roller blind to prevent it from being lifted by burglars and from falling when the belt of the roller blind breaks, movement of said locking bolt being controlled by said belt acting against the pulling force of said spring on a lever connected to said locking bolt and said spring.

## 3,819,218
## ENERGY ABSORBING SAFETY BUMPER

Chang P. Liu, 6036 Scotmist Dr., Palos Verdes Peninsula, Calif. 90274

Continuation-in-part of Ser. No. 137,245, April 26, 1971, abandoned. This application Oct. 3, 1972, Ser. No. 294,518
Int. Cl. B60r *19/06*; F16f *7/12*
U.S. Cl. 293—70 2 Claims

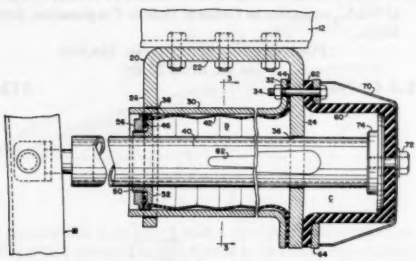


A kinetic energy absorbing safety structure including at least one adjustable and replaceable elongated energy-absorbing element, the element being disposed in the structure to absorb kinetic energy only by elongating plastically under a simple uniaxial tension load, the tension load being exerted on the element when a compressive force is applied to an impact portion of the structure.

## 3,819,219
## COLLISION ENERGY ABSORBER

Karl A. Pamer, Chagrin Falls, Ohio, assignor to McNeil Corporation, Akron, Ohio

Filed Nov. 22, 1972, Ser. No. 308,808
Int. Cl. B60r *19/08*; F16f *9/10*
U.S. Cl. 293—88 11 Claims

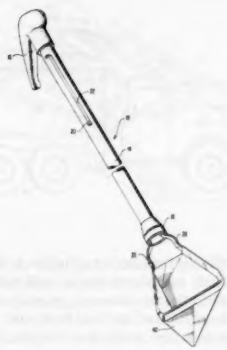


A collision bumper connected to one of two relatively movable rigid parts of a pair of energy absorbing devices, the other parts of which are connected to the frame of a vehicle. The parts of the respective energy absorbing devices connected to the vehicle frame comprises rigid plate-like members provided with apertures through which rod-like portions of the parts connected to the bumper projects with a close but free sliding fit. Rigid tubular-like members extend from the bumper sides of the plate-like members and surround flexible tube-like members having their one ends sealed about the apertures in the platelike members and their other ends sealed to the rod-like portions. The ends of the rigid parts of the devices opposite to the ends connected to the bumper are fixed to the bottom of cup-like relatively heavy tube like elastic members enclosed in cup-like rigid members and having their open ends sealed about the apertures to the plate-like members. The open ends of the rigid cup-like members normally abut against the plate-like members and the relative depths of the elastic and cup-like members are such that the elastic members are under tension. The tube-like and elastic members are filled with liquid and the rod-like portions have axially extending grooves of decreasing cross section to meter the flow of fluid from the bumper side of the plate-like members to the other.

## 3,819,220
## ANIMAL SANITARY DEVICE

Elmer S. Bredt, 1722 E. Moyamensing Ave., Philadelphia, Pa. 19148

Filed Jan. 15, 1973, Ser. No. 323,634
Int. Cl. A47f *13/06*
U.S. Cl. 294—19 R 7 Claims

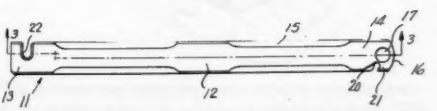


A sanitary device for pets comprises a wand having at one end a pair of spring arms which normally are biased apart. A disposable receptacle having sleeve portions around its normally open top has such portions fitted on said arms to be held open thereby and positioned beneath a pet to receive feces as the latter is discharged. The receptacle is fitted on the arms, the arms squeezed together, the receptacle wrapped around the arms and a sleeve telescoped on the wand to retain the device in readiness. After use, the receptacle may be carried by the wand to the nearest trash collector where it may be expelled from the arms by extending the sleeve.

## 3,819,221
## AUTOMOBILE DOOR BUTTON-OPERATING IMPLEMENT

Leo A. O'Connor, 942 LeMoyne Ave., Syracuse, N.Y. 13208

Filed Jan. 9, 1973, Ser. No. 322,201
Int. Cl. A47f *13/06*
U.S. Cl. 294—19 R 7 Claims



An implement to enable the operator of a motor vehicle to reach and operate a remote door locking button of the vehicle. The implement consists of an elongated bar-like member

having recesses on the opposite faces of one end thereof adapted to receive a top end of a door locking button, so that the button can be depressed to locking position by exerting downward force on the implement. At its other end, the bar-like member has a laterally opening slot to receive the shank portion of the button so that the button can be raised to unlocking position by exerting an upward force or upward torque on the implement. The bar-like member is formed with a hook at the recessed end thereof so that the implement can be used to raise or lower packages in the rear part of the vehicle.

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**3,819,222**

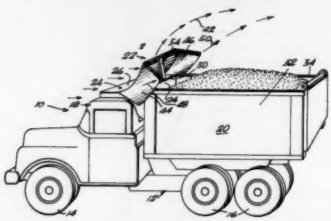
**WIND DEFLECTOR FOR DUMP TRUCKS**

**Boyd Ray Woodard, 1085 N.E. 89th St., Miami, Fla. 33138**

**Filed Dec. 21, 1972, Ser. No. 317,171**

**Int. Cl. B62d** *35/00*

**U.S. Cl. 296—1 S** **5 Claims**



A wind deflector for fixed attachment to a top front portion of the load body of a dump truck, said deflector being configured to deflect the windstream generally upwardly and over the main body portion of the load body and upwardly and outwardly relative to the respective longitudinal side portions thereof.

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**3,819,223**

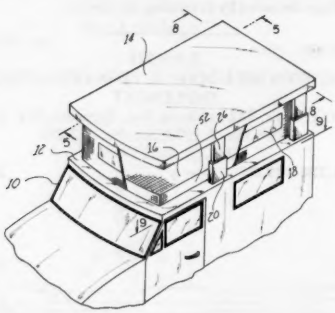
**KAMP-TOP**

**Earnest G. Cobb, and Larry J. Reasnor, both of c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, Fort Bliss, Tex. 10007**

**Filed Nov. 28, 1972, Ser. No. 310,120**

**Int. Cl. B60p** *3/32*

**U.S. Cl. 296—26** **1 Claim**



A vehicle is provided with a top secured to the vehicle's roof. The top carries a mattress and has a mounted retracted position as well as an upwardly extended position for use as a bed. A hand crank operates telescoping columns to raise or lower the top. Ends and sides of the attachment are enclosed.

**3,819,224**

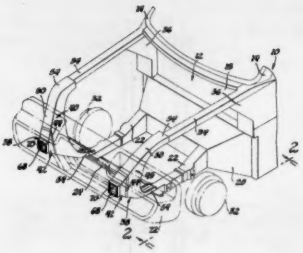
**VEHICLE BODY CONSTRUCTION**

**William D. Casey, Farmington; William R. Frank, Sterling Heights, and Antonino Simonte, Troy, all of Mich., assignors to General Motors Corporation, Detroit, Mich.**

**Filed May 10, 1973, Ser. No. 359,015**

**Int. Cl. B62d** *21/00;* **B60r** *19/02*

**U.S. Cl. 296—28 R** **3 Claims**



A vehicle body having a structurally rigid passenger compartment the forward portion of which is defined by a reinforced bulkhead assembly includes a first pair of supports extending longitudinally from the bulkhead assembly, a second pair of supports extending longitudinally from the bulkhead assembly and disposed below the first pair of supports, a collision bumper assembly, and a pair of polyhedral energy absorbing modules disposed between corresponding pairs of first and second supports and the bumper assembly. Each module is generally triangular in configuration and includes an outer skin adapted for accordian-like distortion with consequent energy absorbing plastic deformation in response to an impact on the bumper assembly, the modules thereby absorbing a portion of the kinetic energy of impact.

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**3,819,225**

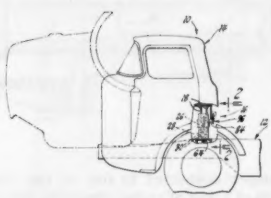
**OVERCENTER LATCH MECHANISM FOR A TILTING TRUCK CAB**

**Gilbert A. Carlisle, Milford, and Charles E. Frank, Utica, both of Mich., assignors to General Motors Corporation, Detroit, Mich.**

**Filed May 10, 1973, Ser. No. 358,986**

**Int. Cl. B62d** *27/06*

**U.S. Cl. 296—35 R** **4 Claims**



An overcenter latch mechanism for holding a tilting truck cab in a lower use position and selectively allowing upward tilting movement of the cab to a raised position. A pair of spaced support members mounted on the rear end of the cab are cooperable with a pair of spaced support members mounted on the chassis so as to position the rear end of the cab in the lower use position. A keeper of the latch mechanism is located between the support members on the chassis and is resiliently mounted by a helical spring arrangement. The bolt of the latch mechanism includes a lower

hooked portion and an upper bighted portion, with the hooked portion opening to one side of the bolt to receive the keeper, and with the bighted portion opening to the other side of the bolt. The upper end of the bighted portion of the bolt is pivoted about a movable axis between adjacent first ends of a pair of spaced support links, and adjacent second ends of these support links are fixed to a control pin which is rotatably supported between the support members on the cab. A manually actuated handle is connected to an actuating link that is fixed to one end of the control pin to move the support links between first and second positions. When the support links are positioned in their first position, the latch mechanism is in a latched condition with the keeper held by the hooked portion of the bolt and with the control pin received by the open side of the bighted portion of the bolt in an overcenter relationship relative to the keeper and the movable axis at the first ends of the support links so as to secure the cab in its lower use position. Movement of the support links to their second position upon actuation of the handle moves the control pin out of this overcenter relationship and moves a control member on the support links into engagement with a control surface on the bolt so as to move the bolt against gravity to an inclined unlatched position where the keeper is free of the bolt to allow upward cab movement to its raised position.

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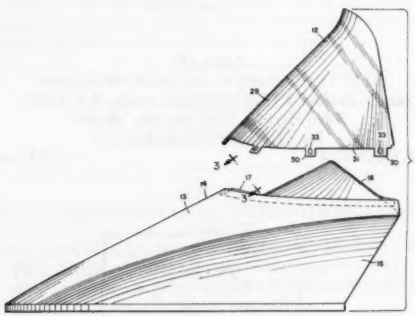
**3,819,226**

## ATTACHMENT ASSEMBLY FOR SNOWMOBILE WINDSHIELD

**Hans Werner Sykora, Drummondville, Quebec, Canada, assignor to The Coleman Company, Inc., Wichita, Kans.**

**Filed Oct. 10, 1972, Ser. No. 296,328**
**Int. Cl. B60j** *1/02*
**U.S. Cl. 296—90** **7 Claims**



A snowmobile is provided with a windshield attachment assembly which permits the windshield to be releasably snapped into place. The cowl of the snowmobile is provided with a V-shaped groove and a plurality of slots which extend through the groove. A lug retainer or keeper extends away from the lower surface of the cowl below each of the slots, and each lug retainer includes a camming surface extending away from the cowl and a lug retaining surface. The windshield includes a plurality of generally planar lugs which extend downwardly from the bottom edge of the windshield, and each of the lugs is provided with an opening therethrough. The windshield is attached by inserting each of the lugs through one of the slots in the cowl, and as each lug extends through the slot, it is cammed away from the lower surface of the cowl by the lug retainer until the lug retainer passes through the opening in the lug. The lug then snaps back into its original position, and the bottom edge of the opening is positioned below the retaining surface of the lug retainer to prevent withdrawal of the lug from the slot. When the windshield is to be removed, each lug can be successively flexed away from the lug retainer to permit upward movement of the lug past the lug retaining surface. If desired, each lug can be provided with a reduced lateral dimension and adjacent the bottom edge of the windshield to permit the windshield to break away from the cowl under a predetermined impact in the event of a crash. The lugs will fracture preferentially across the reduced lateral portions when a forward force is applied to the windshield.

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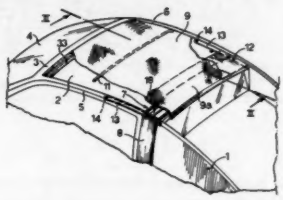
**3,819,227**

## MOTOR VEHICLE WITH SUNSHINE ROOF

**Renzo Carli, Turin, Italy, assignor to Carrozzeria Pininfarina S.p.A, Turin, Italy**

**Filed June 18, 1973, Ser. No. 371,021**
**Claims priority, application Italy, Aug. 24, 1972, 69720/72**
**Int. Cl. B60j** *7/00*
**U.S. Cl. 296—137 D** **8 Claims**



A motor vehicle sunshine roof of the flexible type is tensioned between a front cross member of the vehicle body and a rear roll bar by two levers pivotally attached to the sides of the roof opening. When the roof is opened the flexible roof portion is rolled up and accommodated in a receptacle formed in the roll bar.

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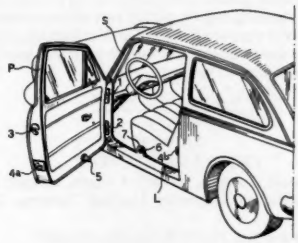
**3,819,228**

## INTERLOCKING DEVICE FOR AUTOMOBILE DOORS

**Felice Cornacchia, Turin, Italy, assignor to Fiat Societa per Azioni, Turin, Italy**

**Filed Nov. 16, 1972, Ser. No. 307,256**
**Claims priority, application Italy, Nov. 19, 1971, 70792/71**
**Int. Cl. B60j** *5/04;* **B60r** *21/02*
**U.S. Cl. 296—146** **1 Claim**



The invention provides improved collision-resisting structure for withstanding side impacts on automobile doors. The door and the door sill have interengageable elements which become coupled together upon initial deformation of the door when subjected to a side impact, preventing upward and inward deformation of the door panel by effectively locking the bottom edge of the door to the sill.

**3,819,229**

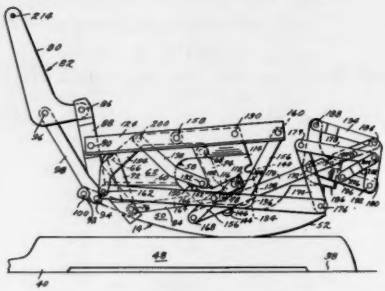
## ROCKER RECLINER CHAIR

**W. Clark Rogers, Jr., and Morton Snitzer, both of High Point, N.C., assignors to The Lane Company, Inc., Altavista, Va.**

**Continuation-in-part of Ser. No. 87,280, Nov. 5, 1970, abandoned. This application Mar. 15, 1971, Ser. No. 124,055**

**Int. Cl. A47c** *1/035, 3/02*

**U.S. Cl. 297—84** **1 Claim**



The chair back is reclined independently of movement of the footrest which is operated by a handle. Detents associated with the handle mechanism allow the footrest to be extended and retracted into any four positions including fully extended, fully retracted and two intermediate positions. As the back is reclined, the seat and arms which constitute a unit, are first tilted to a predetermined "bucketing"angle by the locking mechanism, forward rocking is inhibited then rearward rocking is also prevented by the novel locking mechanism. The locking mechanism mounts on the underside of the cam frame, between the cams and works off a torque tube that moves angularly about its long axis as the footrest is operated and which moves forward and upwardly and rotates angularly as the chair back is reclined. The seat and frame unit also move forwardly and upwardly as the chair is reclined. In the preferred form, the chair is a platform rocker; it may also be mounted on a swivel platform rocker base. The back is provided with tapered sleeves which fit over tapered tongues on the mechanism to allow the chair to be shipped knocked down, and then set-up. The footrest includes two sections which store one behind the other when retracted, then move to coplanar relationship as the footrest is extended to its first position to provide greater extension. The lazy tongs action of the footrest extending and retracting part of the mechanism is skewed to permit exposed front rail and/or high leg styling for the base. The design of the mechanism permits a particularly cushioning seat filling to be used.

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**3,819,230**

## CHILD'S SAFETY SEAT

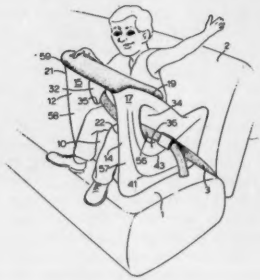
**Milton W. Bloom, Toronto, Ontario, Canada, assignor to Donlee Manufacturing Industries Limited, Toronto, Ontario, Canada**

**Filed Jan. 15, 1973, Ser. No. 323,887**

**Int. Cl. A47c** *1/08*

**U.S. Cl. 297—250** **3 Claims**

A child's auto safety seat comprising a generally U-shaped portion having a base and a pair of opposed side walls extending upwardly from the said base and spaced apart sufficiently to enable the users lower body to be seated on said base and the users legs to extend through the space defined by the side walls, a transverse wall member formed of or supporting an energy absorptive material joined integrally to the side walls at an upper portion of said side walls for restraining the user's upper body, and an opening formed in each side wall at a level



above the center of gravity of the seat for receiving a safety seat belt for securing the safety seat against a vehicle seat and the vehicle seat backrest.

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## ERRATUM

For Class 297—458 see:
Patent No. 3,819,232

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**3,819,231**

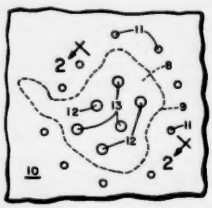
## ELECTROCHEMICAL METHOD OF MINING

**Francis P. Fehlner, 83 E. Fourth St., Corning, N.Y. 14830**

**Filed Mar. 29, 1973, Ser. No. 346,013**

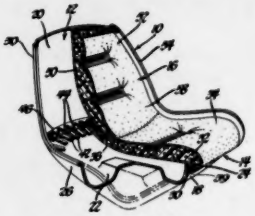
**Int. Cl. E21b** *43/28;* **E21c** *41/14*

**U.S. Cl. 299—4** **22 Claims**



An in situ electrochemical method for extracting the mineral values from an ore body without greatly disturbing or polluting the ecology of the area. Holes are drilled into the ore body which is then fractured and propped. A leachant, introduced through the drill holes and cracks, solubilizes the mineral values in the ore. Anodes and cathodes are introduced into alternate drill holes and a DC electric potential is applied between them. The solubilized mineral values move to the cathode where they plate out as a metal. The leachant is simultaneously regenerated at the cathode. Thus leaching and plating continue in a cyclic process within a sealed portion of the ore body. The metal is recovered by removing the cathode from the drill hole.

3,819,232
## VEHICLE SEAT CONSTRUCTION
Richard M. Wagner, Bloomfield Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Aug. 21, 1972, Ser. No. 282,168
Int. Cl. A47c 7/02
U.S. Cl. 297—458 3 Claims

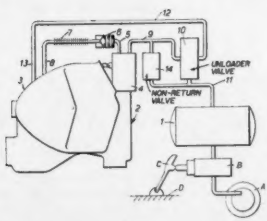


This disclosure relates to a vehicle seat construction which comprises a seat frame that has cushion and back support portions, a padded cushion trim assembly, and a padded back trim assembly. The cushion trim assembly is peripherally secured to the cushion support portion of the frame and is suspended thereacross. The cushion trim assembly has a rearward portion which is contoured upwardly adjacent the back support portion of the frame and is connected therewith with resilient means to provide for the cushion trim assembly to conform to the shape of an occupant. The back trim assembly is positioned upon the back support portion of the frame and has a lower portion which depends forwardly over and engages the upwardly contoured rearward portion of the cushion trim assembly. The cushion and back trim assemblies, when the seat construction is occupied, conform to the shape of the occupant with the rearward portion of the cushion trim assembly and the lower portion of the back trim assembly firmly supporting the lower back of the seat occupant.

## ERRATUM

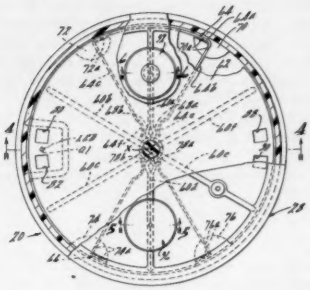
For Class 299—37 see:
Patent No. 3,819,144

3,819,233
## GAS TURBINE VEHICLE EQUIPPED WITH PNEUMATIC BRAKES
Mark Cary Sedwick Barnard, Kenilworth, and John Oliver Philip Hughes, Whitelead, Princes Risborough, both of England, assignors to British Leyland Truck and Bus Division Limited, Leyland, Lancashire, England
Filed Oct. 4, 1972, Ser. No. 294,895
Claims priority, application Great Britain, Oct. 12, 1971, 47339/71
Int. Cl. B60t 17/02
U.S. Cl. 303—1 8 Claims



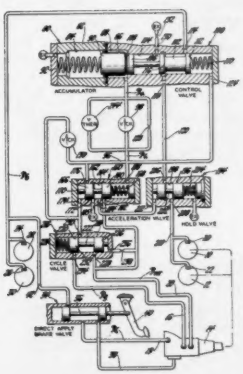

In a gas turbine vehicle equipped with a pneumatic brake system, the compressor of the gas turbine engine is used to supply the quantity of air required for the brakes, and a separate engine-driven compressor is used to boost the pressure of this air to the extent necessary for operating the brake system. The separate engine-driven compressor is supplied, through a check valve and an air-cooled intercooler, with compressor delivery air from a tapping on the casing of the compressor of the gas turbine engine.

3,819,234
## TRAILER SWAY CONTROL SYSTEM
William J. Couchois, Plymouth, and Roger E. Doerfler, Detroit, both of Mich., assignors to Kelsey-Hayes Company, Romulus, Mich.
Filed Mar. 6, 1972, Ser. No. 231,976
Int. Cl. B60t 7/20
U.S. Cl. 303—20 31 Claims



A system for detecting the occurrence of an incipient, excessive sway condition of a trailer and for automatically applying the trailer brakes to inhibit and/or correct the sway condition.

3,819,235
## ANTI-LOCK BRAKE SYSTEM
Lauren L. Bowler, Bloomfield Hills, and Laird E. Johnston, Birmingham, both of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Oct. 30, 1972, Ser. No. 302,097
Int. Cl. B60t 8/12
U.S. Cl. 303—21 F 3 Claims



A brake system includes an operator actuated direct apply brake valve which channels fluid from a pump to the wheel brakes. An extremal anti-lock controller includes a transmis-

sion governor providing a fluid pressure equal to the average rear wheel speed and an accumulator which receives and stores fluid from the governor. Return of fluid from the accumulator to the governor during wheel deceleration is through a deceleration orifice which restricts the flow to a rate corresponding to the equivalent of braking under optimum conditions and thereby provides a pressure differential equivalent to the difference between the actual wheel velocity and the predetermined maximum wheel velocity during braking under optimum conditions. This pressure differential operates a control valve interposed between the apply valve and wheel brakes which exhausts brake pressure to release the brakes. A period of wheel acceleration follows the brake release and during the resulting wheel speed recovery the accumulator is recharged and the control valve shifts to recommunicate the apply valve to the brakes. An acceleration valve senses the wheel speed recovery permitted by the brake release and closes a hold valve which maintains the brake pressure at its then existing magnitude to provide the hold mode of the extremal cycle. When the wheel speed recovery ends, the acceleration valve and hold valve are shifted and the apply valve is recommunicated to the brakes to initiate the brake apply mode of the extremal cycle. A thermostatic valve disables the anti-lock control system when oil temperature is below a predetermined temperature at which fluid viscosity impairs system function. A cycle valve exercises the anti-lock system each time the transmission is shifted out of reverse into neutral or drive.

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**3,819,236**

## ANTISKID CONTROL ARRANGEMENT

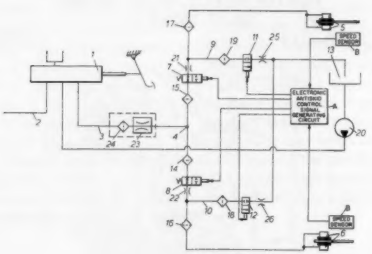
**Werner Fink, and Dieter Kircher, both of Frankfurt am Main, Germany, assignors to ITT Industries Inc., New York, N.Y.**

**Filed Sept. 22, 1972, Ser. No. 290,293**

**Claims priority, application Germany, Nov. 4, 1971, 2154806**

**Int. Cl. B60t *8/12***

**U.S. Cl. 303—21 F** **5 Claims**



There is disclosed a hydraulic control arrangement for an antiskid control system. The hydraulic control arrangement includes, in addition to known arrangements responsive to a continuously measured control value to prevent wheel lock, differently cooperating throttles and an emergency throttle for the synchronous and asynchronous control of the wheels of one axle. The throttles and emergency throttle control the build up and decrease of brake pressure in the wheel brake cylinders of the wheels of a single axle in a manner to prevent a jerky control of the brake pressure and, thus, an uncomfortable ride.

**3,819,237**

## ELECTRONIC ANTISKID BRAKING SYSTEM

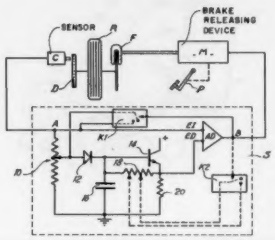
**Guy Marouby, Neuilly, France, assignor to Societe Anonyme D.B.A., Paris, France**

**Filed Nov. 10, 1972, Ser. No. 305,647**

**Claims priority, application France, Dec. 2, 1971, 71.43239**

**Int. Cl. B60t *8/08***

**U.S. Cl. 303—21 BE** **5 Claims**




An electronic antiskid braking system of the type using a speed reference signal having a maximum rate of decrease as established, furnished by the constant current discharge of a capacitor in a circuit, is disclosed.

The maximum slippage which is tolerated by the wheel includes a constant quantity which is determined by a potentiometer, and includes too a variable quantity, which is obtained from the direct voltage-drop in a diode. A switching device controlled by the first occuring pressure reducing signal of an antiskid braking operation, is provided to modify the intervention threshold during the initial adaptive braking cycle.

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**3,819,238**

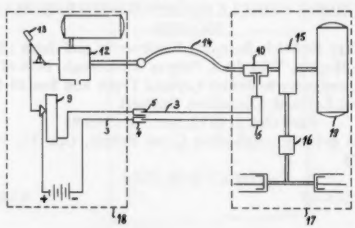
## BRAKE AND EMERGENCY BRAKE INSTALLATION FOR VEHICLE TRAILERS

**Eduard Cermak, Hadynstr. 6, Heilbronn, Germany**

**Filed Dec. 6, 1972, Ser. No. 312,745**

**Int. Cl. B60t *15/46***

**U.S. Cl. 303—47** **5 Claims**



Improvement in conventional pneumatic braking systems for lead and trailer vehicles wherein actuation of the trailer braking system is accelerated to overcome time lag between application of brake pedal or lever and the trailer brakes, a condition which may dangerously affect the relationship between lead vehicle and trailer, i.e., jack knifing, over extended braking distance. Accelerated actuation is achieved either by (1) an air vent valve located in the vicinity of the trailer brake valve assembly, and electrically actuated by depression of the brake pedal or lever, or (2) a straight-way valve between the trailer brake auxiliary compressed air reservoir and brake cylinder assembly which may be actuated by a

pressure switch and relay associated with the brake pedal assembly to instantaneously by-pass the brake valve assembly and cause initial braking which, upon sustained depression of the brake pedal, is followed by the normal brake system operation.

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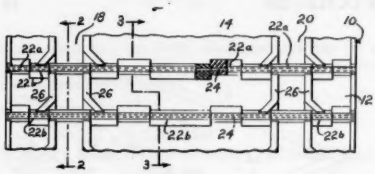
**3,819,239**
**ENDLESS TRACK**

**Leonard Arcouette, Granby, Quebec, Canada, assignor to Twinpak Ltd., Quebec, Canada**

**Continuation-in-part of Ser. No. 87,991, Nov. 9, 1970, abandoned. This application Sept. 8, 1972, Ser. No. 287,432**
**Claims priority, application Canada, Nov. 4, 1970, 97429**
**Int. Cl. B62d** *55/22*
**U.S. Cl. 305—35 R** **3 Claims**




The track for a snowmobile endless track made up of relatively rigid links having a pair of spaced-apart rows of driving sprocket engagement apertures.

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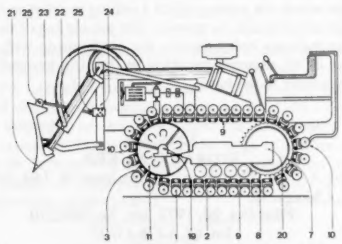
**3,819,240**
**ENDLESS TRACK**

**Gilbert Abel Bibaut, Le Meux, France**

**Filed Mar. 21, 1972, Ser. No. 236,665**
**Claims priority, application France, Mar. 22, 1971, 71.10013; Mar. 15, 1972, 72.9036**
**Int. Cl. B62d** *55/26*
**U.S. Cl. 305—54** **4 Claims**

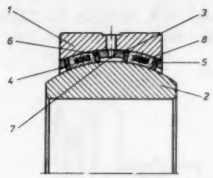



Track for all ground vehicles, in particular for equipment with endless tracks, consisting of tubular members in the form of hollow cylinders fixed during rotation, of the endless track each cylinder being welded onto a U-section bolted on one of the links of the chain. Another embodiment of the invention discloses a cylinder being mounted so that it can oscillate on a transversal axis perpendicular to its length. The tubular member being extendible by cooperation of a sleeve affixed to the outer extremity of the tubular member and a tubular extension member.

**3,819,241**
**SLIDE BEARINGS AND JOURNALS**

**Manfred Memmel, Schweinfurt, Germany, assignor to SKF Industrial Trading and Development Company, Amsterdam, Netherlands**

**Filed Oct. 4, 1972, Ser. No. 294,893**
**Claims priority, application Germany, Oct. 19, 1971, 7139476**
**Int. Cl. F16c** *33/12*
**U.S. Cl. 308—3 R** **12 Claims**




A slide bearing or journal having a pair of opposed support means. Glide elements are located between the support members, the glide elements being held by rigid thrust means also forming a sliding surface with the support members. The glide elements are elastic and project from the edge of the thrust members when the bearing is unloaded an amount equal to the elastic compression stroke of the material when the bearing is loaded.

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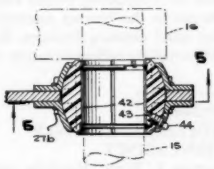
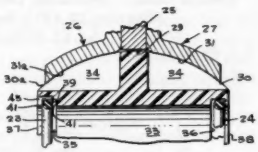
**3,819,242**
**BRAKE CAMSHAFT SUPPORT ASSEMBLY**

**James R. Robinson, Prattville, Ala., assignor to Standard Forge and Axle Company, Incorporated, Montgomery, Ala.**

**Filed Mar. 30, 1973, Ser. No. 347,402**
**Int. Cl. F16c** *33/74*
**U.S. Cl. 308—36.1** **16 Claims**




An assembly for supporting on the beam of an axle assembly, a brake camshaft having a slack adjustor removably mounted thereon by means of a spline connection, generally including a bracket rigidly mountable on the axle beam, a bushing mounted on the bracket in which the camshaft is journaled adjacent the spline connection between the camshaft and the slack adjustor, means for lubricating the bearing surface of the bushing, and at least one relief passageway communicating with the lubricating means and communicable with the spline connection between the camshaft and the slack adjustor whereby upon lubricating the bushing, any excess pres-

sure developed in the lubricating means of the bushing will be relieved by the escape of lubricant under pressure through the relief passageway which is supplied to the spline connection between the camshaft and the slack adjustor.

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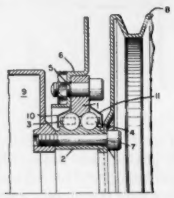
**3,819,243**

## BEARING UNIT FOR A ROTATING DRUM

**Sture Lennart Asberg, Savedalen, Sweden, and Domenico Lo Nardo, Piossasco, Italy, assignors to SKF Industrial Trading and Development Co., N.V., Amsterdam, Netherlands**

**Filed Feb. 7, 1972, Ser. No. 223,909**
**Claims priority, application Sweden, Feb. 5, 1971, 1426/71**
**Int. Cl. F16c *33/00***
**U.S. Cl. 308—191** **5 Claims**



The combination comprising a housing, a drum supported at only one axial end and mounted for rotation about a horizontal axis and drive means for rotating the drum about said axis, and a bearing assembly for rotatably supporting said drum in said housing comprising a pair of spaced annular members having confronting raceways, a plurality of rolling elements in the annular space between said annular members, first connecting means for connecting one of said annular members to said housing, second connecting means connecting the other annular member to said one axial end of said drum and drive means, the connecting means being located closely adjacent said rolling elements, the radius of the smallest pitch circle of the rolling elements and the radial distance between the bearing center and the connecting means connecting the drum and drive means to the bearing assembly being greater than the greatest axial distance between the planes which limit the outer outlines of the rolling elements in the axial direction.

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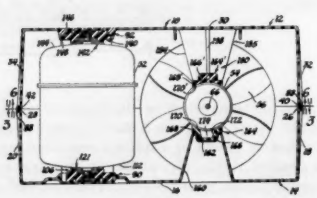
**3,819,244**

## TWO-SECTIONED ROOM AIR CONDITIONER CONSTRUCTION CABINET

**David R. Paulick, Dayton; Emerson L. Wark, Vandalia, and William E. Koeppen, Kettering, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.**

**Filed May 29, 1973, Ser. No. 364,901**
**Int. Cl. F25d *23/08***
**U.S. Cl. 312—101** **4 Claims**



A two-sectioned room air conditioner cabinet including a top half section and bottom half section which cooperate when joined together by outwardly extending flanges formed on opposite sides adjacent the open ends to enclose the refrigeration and air handling assemblies therein. The top and bottom walls of the cabinet have opposed pairs of integrally molded retainer means including rubber-like bushings and pads designed in such a manner that when the two casing sections are locked together by elongated C-shaped clamps engaging the side flanges the compressor motor and fan motor housings are fixably retained in a cushioned manner within the cabinet.

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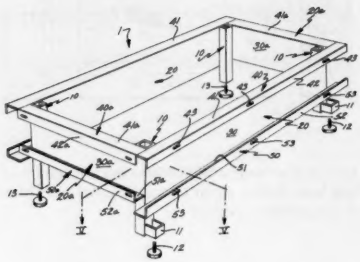
**3,819,245**

## BASE FOR CABINET OR THE LIKE

**William H. Tacke, Wyoming; Robert B. Ormiston, and Lonnie L. McCrackin, both of Grandville, all of Mich., assignors to Steelcase Inc., Grand Rapids, Mich.**

**Filed June 2, 1972, Ser. No. 259,100**
**Int. Cl. A47b *91/00, 77/08, 43/00***
**U.S. Cl. 312—253** **10 Claims**



A base for cabinets or the like including inner supporting legs rigidly joined by channel members which are sufficiently wide to define a wiring channel. The base can be aligned with adjacent partitions such that one of its wiring channels is generally continuous with that of the partition. The channel walls include cover supporting flanges spaced outwardly from the inner supporting legs. A cover panel for each side of the base is removably clipped to these cover supporting flanges. Each cover includes a wiring knockout generally in line with a wiring channel. Each panel also includes a small slot knockout through which the joining leg of a joining bracket secured to a channel member can be passed. The joining leg of the joining bracket includes holes therein for cooperating with bolts or the like of an adjacent partition so that the partition can be joined directly to the base.

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**3,819,246**

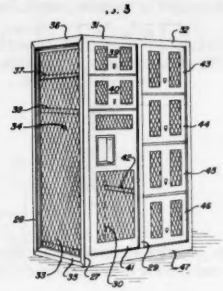
## STORAGE LOCKER

**Herbert A. List, Flossmoor, Ill., assignor to List Industries, Inc., Chicago, Ill.**

**Filed Oct. 20, 1972, Ser. No. 299,270**
**Int. Cl. A47b *43/00***
**U.S. Cl. 312—257 SK** **11 Claims**

A substantially closed multi-sided elongated channel frame locker support member is provided and includes a pair of converging side panels substantially closing the cross-section of the channel frame. Each of the converging side panels of the channel frame is at a pre-selected angle to its adjacent side panel so that the channel frame can be pre-engineered with one or more arrays of shelf locating and receiving slots in each of the converging side panels and a corresponding number of arrays of door pivot pin receiving holes in each of the side panels adjacent to a converging side panel. Said arrays of shelf receiving slots and door pivot pin receiving holes are in a predetermined relationship along the length of the channel sup-

port frame. When four of these channel support frames are mounted as vertical locker supports, any one of a wide variety



of modular shelf and wardrobe configurations can be preselected. Use of the channel frame support additionally simplifies the manufacturing process.

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**3,819,247**

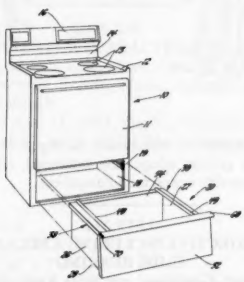
**ONE-PIECE RANGE DRAWER HAVING INTEGRAL SKIDS**

**Jesse L. Evans, Tipp City, Ohio, assignor to General Motors Corporation, Detroit, Mich.**

**Filed Aug. 30, 1973, Ser. No. 392,931**

**Int. Cl. A47b** *88/00, 77/08*

**U.S. Cl. 312—330** **2 Claims**



A range drawer structure formed from a sheet metal blank which is folded up to provide integral skids and a front wall panel with laterally extending sides to conceal the side wall panels of the drawer from the front thereof. The front wall panel is formed in an inwardly canted manner to allow a forwardly extending flange from the top edge of the front wall panel to be formed with a rolled edge to provide an integral drawer handle at least partially recessed inwardly from the front face of the range cabinet.

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**3,819,248**

**MULTIPLE EXPOSURE HOLOGRAPHIC APPARATUS IN WHICH PHASE RELATIONSHIP IS RANDOMLY CHANGED WITH EACH EXPOSURE**

**Yasutsugu Takeda, 4-22-10 Honcho, Kokubunji; Yoshitada Oshida, 438 Minamioizumi-machi, Tokyo, and Fumio Imagawa, 2278-Owada-cho, Hachioji, all of Japan**

**Filed Sept. 18, 1972, Ser. No. 289,649**

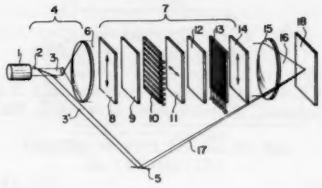
**Claims priority, application Japan, Sept. 16, 1971, 46-71193**

**Int. Cl. G02b** *27/00*

**U.S. Cl. 350—3.5** **6 Claims**

A multiplex exposure type holographic apparatus, wherein the light which has passed through a two-dimensional light information composing element, such as a light shutter and the interferential reference light are caused to interfere with each other on the surface of a light recording medium to thereby make a hologram, characterized in that, in order to eliminate

PRIOR ART



noise of the reproduced image produced in said apparatus, means for modulating the light phase is provided in the path either of the object light beam or of the reference light beam, so as to provide a relative phase difference when each exposure is made in the multiplex exposure process.

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**3,819,249**

**OPTICAL COUPLING ARRANGEMENT**

**Manfred Borner, Ulm/Donau; Stefan Maslowski, Aufheim, and Oskar Krumpholz, Ulm/Donau, all of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Germany**

**Filed Oct. 1, 1971, Ser. No. 185,690**

**Claims priority, application Germany, Oct. 2, 1970, 2048439; Oct. 2, 1970, 7036438**

**Int. Cl. G02b** *5/14*

**U.S. Cl. 350—96 WG** **24 Claims**

A coupling arrangement for coupling a light beam from an output of one optical device to an input of another optical device. At least one of the two optical devices is a light conductive fiber having a substantially totally reflecting core in a major portion of the fiber. The light conductive fiber is provided at a coupling point with an effective entrance surface or exit surface for the light beam which is larger than the cross section of the substantially totally reflecting core.

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**3,819,250**

**TEMPERATURE SENSITIVE FIBER-OPTIC DEVICES**

**Lynden Underwood Kibler, Middletown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

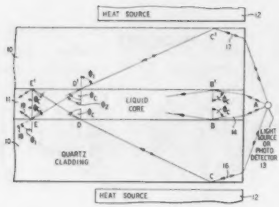
**Filed Dec. 20, 1972, Ser. No. 316,655**

**Int. Cl. G02b** *5/14*

**U.S. Cl. 350—96 R** **5 Claims**

An optical fiber with a quartz cladding and a liquid core is used to create an aperture coupler and a low loss small radius

bend light guide by controlling th·· temperature of the fiber. Also, a directional coupler is formed by placing two light carrying quartz rods in a dielectric liquid and controlling the temperature of the liquid and rods.

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**3,819,251**

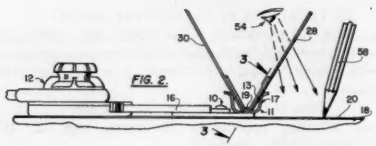
**LETTERING GUIDE HAVING DOUBLE CLIP**

**Daniel H. Hoggan, 955 Foothill Dr., Providence, Utah 84332**

**Filed July 25, 1972, Ser. No. 275,088**

**Int. Cl. G02b** *27/02*

**U.S. Cl. 350—121** **5 Claims**




A lettering guide having a double clip member attached to the base thereof adapted to hold a tinted transparent window card and an image-producing card in fixed angular relationship with each other, so that lettering guide lines are reflected from the image-producing member onto a drawing surface to avoid the necessity of penciling in, and later erasing, lettering guide lines. The clip comprises a rigid inner member having two mutually opposing arms disposed at a predetermined acute angle with respect to each other, and a second outer clamping member having a pair of arms of flexible, resilient construction with a configuration paralleling that of the inner member. The two pair of arms form a cooperating pair of apertures in fixed angular relationship with each other for holding a transparent window card and an image-producing card.

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**3,819,252**

**ADDITIVES THAT INCREASE THE STABILITY OF ELECTROCHROMIC FILMS IN ELECTROCHROMIC DEVICES**

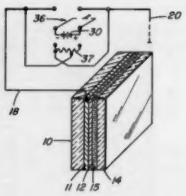
**Robert Domenico Giglia, Rye, N.Y., assignor to American Cyanamid Company, Stamford, Conn.**

**Filed Dec. 21, 1972, Ser. No. 317,458**

**Int. Cl. G02f** *1/40*

**U.S. Cl. 350—160 R** **8 Claims**

An electrochromic data display and imaging device which may be formed by sandwich arrangement of the imaging area, the counter-electrode area with a suitable electrolyte layer between, having additives incorporated in the electrolyte. The



device exhibits superior electrochromic reversibility and improved speed and cell life over prolonged coloration and erase cycles.

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**3,819,253**

**TELEPHOTO LENS SYSTEM**

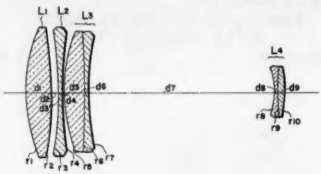
**Keiichi Itoh, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo-to, Japan**

**Filed May 11, 1973, Ser. No. 359,537**

**Claims priority, application Japan, May 15, 1972, 47-47166**

**Int. Cl. G02b** *9/24; 13/02*

**U.S. Cl. 350—220** **1 Claim**



A compact telephoto lens system having powers of the front and rear lens groups adequately balanced, small telephoto ratio and favourably corrected aberrations.

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**3,819,254**

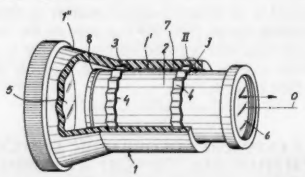
**OPTICAL OBJECTIVE INCLUDING A SELF-CENTERING SLIDE BEARING**

**Lothar Hummel, Gottingen, and Fritz Kerl, Waake, both of Germany, assignors to Isco Optische Werke GmbH, Gottingen, Germany**

**Filed Oct. 26, 1972, Ser. No. 300,882**

**Int. Cl. G02b** *7/02*

**U.S. Cl. 350—255** **7 Claims**

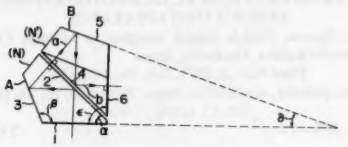


A pair of telescoped tubes, serving as lens carriers for a varifocal objective, are slidably interfitted with the aid of two corrugated annular springs of metal or plastic material lodged in axially spaced peripheral grooves on the inner surface of the outer tube. The springs may be split for better accommodation to varying tolerances between the tube diameters; they can also serve as abutments to limit the relative displacement of the tubes.

## 3,819,255
## EYE-LEVEL AND WAIST-LEVEL VIEWFINDER

**Sei Matui, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan**

**Filed June 12, 1973, Ser. No. 369,315**
**Claims priority, application Japan, June 19, 1972, 47-60467**
**Int. Cl. G03b** *13/02*
**U.S. Cl. 88—1.5 R** **4 Claims**

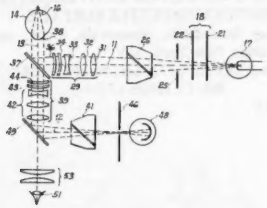


A pentagonal dach prism is divided into two prisms by providing two dividing surfaces between the first and second reflecting surfaces of the pentagonal dach prism. The angles between the first dividing surface and the surface of incidence, between the first reflecting surface and the surface of incidence, between the second reflecting surface and the surface of incidence, and between the surface of emergence and the surface of incidence, are selected to satisfy certain relationships. The second prism is rotatatively displaceable through 180° about a principal optical axis passing from the first to the second prism. A viewfinder employing such pentagonal dach prism may be selectively used as an eye-level viewfinder and as a waist-level viewfinder.

## 3,819,256
## APPARATUS FOR REFRACTING THE EYE

**John G. Bellows, 1040 N. Lake Shore, Chicago, Ill. 60611, and Howard C. Borough, Seattle, Wash., assignors to said Bellows, by said Borough**

**Filed Aug. 11, 1972, Ser. No. 279,869**
**Int. Cl. A61b** *3/00;* **G01n** *21/46*
**U.S. Cl. 351—6** **10 Claims**

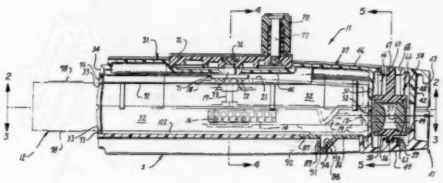


An apparatus for refracting the eye utilizes two separate optical paths to minimize stray light and optical interference. The apparatus includes dual lens means, each disposed along one of the optical paths, for selectively varying the spatial relationship of a beam of radiant energy passing therethrough. The apparatus comprises a source of radiant energy, modulating means for forming a modulated beam of radiant energy, first lens means, projecting means for introducing a portion of the beam into the eye and for receiving and projecting a reflection of the beam from the retina of the eye along the second optical path, second lens means coupled to the first lens means, and analysis means for forming an image of the reflection and determining the sharpness of focus of the image. The modulating means comprises a dual bladed light chopper which presents to the eye an image of a moving slit representing in alternate succession two apparent sources of radiant energy at two spaced apart distances. The lens means are automatically adjusted to achieve optimum sharpness of focus and the magnitude of the correction to the lens means corresponds to the refractive correction required by the eye. Image rotation prisms are disposed along each of the optical paths and together with the analysis means through suitable electronic coupling provide an indication of the presence and magnitude of an astigmatic condition of the eye.

## 3,819,257
## MOTION PICTURE APPARATUS

**Mark O. Uitz, Mountain View; Edwin E. Ewry, Mill Valley; William T. Link, and Hugh Paul Sherlock, both of Berkeley, all of Calif., assignors to Action Films, Inc., Mountain View, Calif.**

**Filed Oct. 30, 1972, Ser. No. 301,763**
**Int. Cl. G03b** *23/02*
**U.S. Cl. 352—72** **13 Claims**

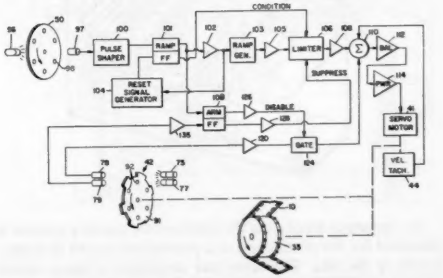


Motion picture apparatus for use with a removable cartridge of the type which has a housing having a cavity formed therein with a rear opening in communication with the cavity whereby the cartridge can be inserted into the cavity and removed from the cavity through the rear opening. An optical assembly is mounted in the housing in front of the cartridge. Means in mounted in the housing for receiving light in a direction generally parallel to the optical axis and for directing it onto the cartridge.

## 3,819,258
## FILM FRAMING AND TRANSPORT SYSTEM

**Lawrence W. Butler, Fallbrook, and Roger W. Banks, Irvine, both of Calif., assignors to Scripps Clemans, Inc. and Lawrence N. Butler, both of Fallbrook, Calif.**

**Filed Sept. 20, 1972, Ser. No. 290,679**
**Int. Cl. G03b** *21/46*
**U.S. Cl. 352—163** **22 Claims**




A film framing and transport system with provision for precisely positioning each frame of film during a film advance interval. A servo motor drives a film sprocket wheel for advancing film frame by frame. Control signals for operating the servo motor are produced by a synchronizing circuit and pulse

circuitry, a velocity tachometer and a positioning circuit. The servo motor control signals cause the servo motor to accelerate and decelerate the film sprocket wheel at a rapid initial and final rate relative to the pull down interval, but sufficiently gradual to avoid excess film sprocket hole wear. The positioning circuitry precisely positions the film sprocket wheel at the end of each pull down interval.

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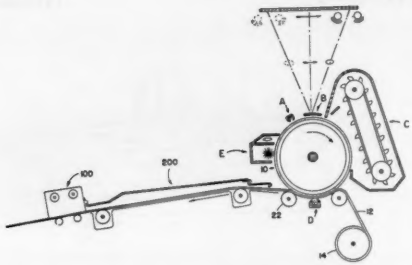
**3,819,259**
**LIGHT ATTENUATOR**

**Adalbert A. Lux, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.**

**Filed May 5, 1972, Ser. No. 250,636**
**Int. Cl. G03g** *15/20*
**U.S. Cl. 355—3** **8 Claims**



Light attenuator which is positioned between a flash fusing assembly and an electrophotographic recording surface to prevent light which emanates from the fuser from reaching the recording surface.

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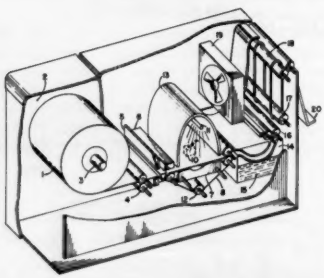
**3,819,260**
**APPARATUS FOR FINGERPRINTING**

**Edward J. Radin, Johnson City, N.Y., assignor to GAF Corporation, New York, N.Y.**

**Filed Oct. 2, 1972, Ser. No. 294,030**
**Int. Cl. G03g** *15/00*
**U.S. Cl. 355—3** **4 Claims**



An apparatus employing the electrostatic copying process is provided for the production of a permanent record of fingerprints or the like. The apparatus comprises a platen which causes sensitized paper having an electrostatic charge to surround the finger or fingers being duplicated. Contact of the paper by the raised portion of a fingerprint dissipates the charge on the paper in the area contacted resulting in the formation of a latent image. Simultaneously therewith, a light source exposes the paper in the area not contacted by the finger to dissipate the charge in the non-image areas. The latent image on the paper thereby represents the depressions between the raised portion of the fingerprints, which do not contact the paper and which are not exposed to light. A developing station is included to develop the sensitized paper to form a permanent fingerprint record.

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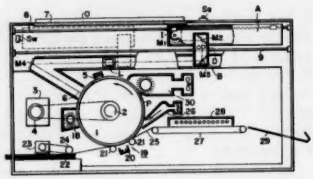
**3,819,261**
**TRANSFER TYPE ELECTROPHOTOGRAPHIC DUPLICATING APPARATUS**

**Masaya Ogawa, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka-fu, Japan**

**Filed Nov. 2, 1971, Ser. No. 194,815**
**Claims priority, application Japan, Nov. 4, 1970, 45-109430**
**Int. Cl. G03g** *15/00*
**U.S. Cl. 355—14** **3 Claims**



In an electrophotographic duplicating apparatus, a rotatable drum supporting the photosensitive material has a circumference slightly greater than the length of the original material to be copied and is rotated through $n+1$ revolutions, wherein $n$ is the number of copies. During the first revolution of the drum the original image is formed on the photosensitive material. A sheet of copying material is transferred into position for the image to be transferred from the photosensitive material. During the second revolution of the drum the photosensitive material is cleaned in preparation for copying of another original.

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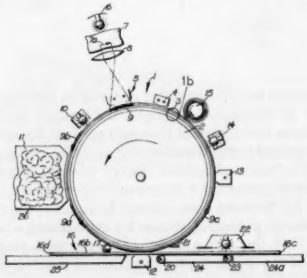
**3,819,262**
**CLEANING MEANS FOR AN OVERCOATED PHOTOCONDUCTIVE SURFACE**

**Adolfo Umadhay Estandarte, Sunnyvale, Calif., assignor to SCM Corporation, New York, N.Y.**

**Filed July 13, 1972, Ser. No. 271,504**
**Int. Cl. G03b** *15/00*
**U.S. Cl. 355—15** **3 Claims**



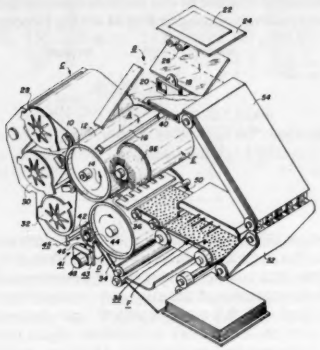
An electrophotographic apparatus and process incorporating an overcoated photoconductor element, an erasing light being utilized after transfer of the toned image to copy paper. The erasing light is used for improvement of image quality by the elimination of image ghosting and edging effect.

3,819,263

## CLEANING APPARATUS

Vaidevutis C. Draugelis, Rochester, and Otto R. Dole, Walworth, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 27, 1972, Ser. No. 238,553
Int. Cl. G03g *15/00*
U.S. Cl. 355—17 3 Claims



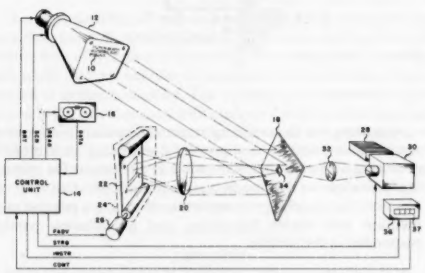
A cleaning apparatus for removing residual toner particles from a transfer member used in an electrostatic reproduction machine. Toner powder images are deposited on a sheet of support material secured releasably to the transfer member, the sheet is stripped therefrom, and the cleaning apparatus actuated to remove residual toner particles adhering to the transfer member.

3,819,264

## METHOD AND SYSTEM FOR PRODUCTION OF ILLUSTRATED TEXTS

Charles H. Voorhees, Burbank, Calif., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Jan. 12, 1973, Ser. No. 323,328
Int. Cl. G03b *27/70, 29/00*
U.S. Cl. 355—43 10 Claims



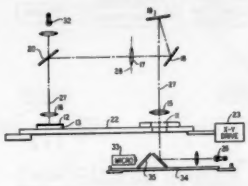

A method and system for the high speed production of illustrated texts wherein textual material is photographically combined with designated illustrative material and the text is prepared from the composite photographic record. The textual material, including illustration identifying indicia, is stored and the stored textual material is electronically displayed for exposure of the photographic film thereto. Illustration identifying indicia associated with displayed textual material is utilized to select a slide containing the desired illustrative material and an image of the illustrative material from the slide is projected onto the film to form a composite photographic record. The illustrated text may then be formed from the composite photographic record.

3,819,265

## SCANNING PROJECTION PRINTER APPARATUS AND METHOD

Martin Feldman, Springfield, and Michael Charles King, Chatham Twp., both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Aug. 2, 1972, Ser. No. 277,275
Int. Cl. G03b
U.S. Cl. 355—51 27 Claims



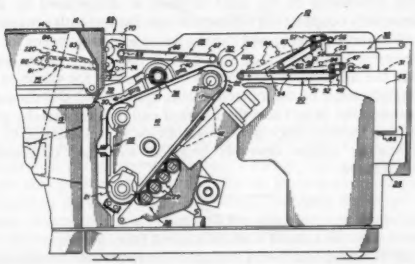
In photolithographic projection apparatus used in semiconductor fabrication, the mask and semiconductor substrate are mounted on a common movable translation table. A small portion of the mask is imaged on the substrate by a high resolution, small image field optical system. The translation table is then moved in *x* and *y* directions to give raster scanning of the substrate by the projected mask image.

3,819,266

## COPIER JAM PROTECTION

Harry C. Price, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 5, 1972, Ser. No. 312,391
Int. Cl. G03b *27/32*
U.S. Cl. 355—64 2 Claims



A copying system incorporating means to stop the system in the event of a paper jam. A control is provided to inhibit restarting of the system except for recycling of the document handler until the malfunction is corrected.

**3,819,267**

## DEVICE FOR MEASURING DIMENSIONS FROM THE FORWARD END PORTION OF AN ENDOSCOPE

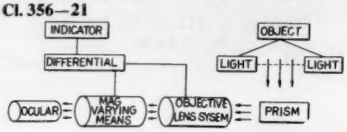
**Ichizo Kawahara, Tokyo, Japan, assignor to Olympus Co., Ltd., Tokyo, Japan**

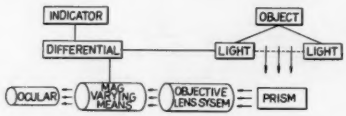
**Continuation-in-part of Ser. No. 114,241, Feb. 10, 1971, abandoned, which is a division of Ser. No. 749,809, Aug. 2, 1968, Pat. No. 3,595,220. This application Aug. 7, 1972, Ser. No. 278,452**

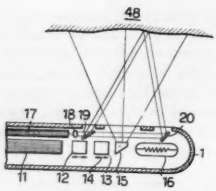
**Claims priority, application Japan, Aug. 8, 1967, 42-50507; Aug. 8, 1967, 42-50508; Aug. 8, 1967, 42-50510; Aug. 29, 1967, 42-73425**

**Int. Cl. G01c** *3/24;* **A61b** *1/06;* **G01b** *11/02*

**U.S. Cl. 356—21** **3 Claims**




The invention disclosed provides a device for measuring the dimension of the field of view of an endoscope, the forward end portion of which is adapted to be inserted into a hollow portion of a living body or the like for the inspection thereof. The endoscope is provided with a variable magnification objective lens system, a differential mechanism and a distance measuring means for determining the distance between the object and the forward end portion of the endoscope. The actual dimension of the field of view is determined by differentially coupling the differential mechanism with a magnification varying means and either a focus adjusting means for an objective lens system, or the distance measuring means such that the differential mechanism compensates for variation in magnification of the objective lens system and the distance between the object and the forward end portion thereby permitting the dimension of the field of view to be indicated by an indicating means operably coupled with the differential mechanism.

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**3,819,268**

## VELOCITY DETERMINATION WITH OPTOELECTRONIC LINEAR POSITION TRANSDUCER

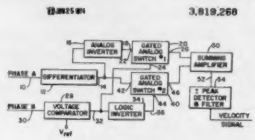
**Albin Kenneth Johnson, Boulder, Colo., assignor to Iomec, Inc., Santa Clara, Calif.**

**Filed Aug. 10, 1972, Ser. No. 279,604**

**Int. Cl. G01p** *3/36*

**U.S. Cl. 356—28** **21 Claims**

A system for electronically determining the velocity of a linear motion actuator such as used in a magnetic disc file unit by processing the output from an opto-electronic position transducer associated with the actuator to obtain a velocity signal. One or both of the 90° phase-displaced output signals from a pair of photodetectors in the position transducer are time differentiated. The time derivative signal is positively or negatively full-wave rectified depending on the direction of actuator motion to produce a signal carrying velocity information in its peak-amplitude and polarity. According to one embodiment rectification is accomplished by appropriately gating the time derivative of one photodetector output and its inverse respectively through a pair of analog switches using gating pulses developed from the other photodetector output signal. The rectified combined signal is then peak detected and filtered to produce a substantially continuous DC velocity signal. An extension of this arrangement superimposes the 90° phase-displaced full-wave rectified time derivative signals from both photodetectors to eliminate signal transitions for high performance applications. Another variation of the present invention provides minimal circuit component cost in an arrangement which uses the logical direction signal from the position transducer to gate either the positive or negative rectified time derivative signal through the switching network.

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**3,819,269**

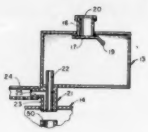
## APPARATUS FOR PARTICLE SIZE ANALYSIS

**Ronald Nash Duvall; Gerald Gold; Richard La Verne Hurtle, and Blasey Thomas Palermo, all of Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.**

**Filed Jan. 26, 1973, Ser. No. 326,848**

**Int. Cl. G01n** *1/00*

**U.S. Cl. 356—36** **4 Claims**



Apparatus for determining size and size distribution of gas suspendable particles in a powder comprising a chamber for enclosing a gaseous medium, such as air, means for suspending particles in the medium, means cooperative with the chamber for sampling at a predetermined rate a portion of the medium and means for sizing and quantitating particles suspended in the sample.

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**3,819,270**

## BLOOD CELL ANALYZER

**Tomas Hirschfeld, Framingham, Mass., assignor to Block Engineering, Inc., Cambridge, Mass.**

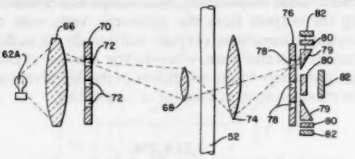
**Filed Oct. 2, 1972, Ser. No. 294,245**

**Int. Cl. G01n** *33/16*

**U.S. Cl. 356—39** **7 Claims**

A system for differentiating among white blood cells by flowing the latter in a supporting liquid through an elongated sheathed-fluid flowcell in which various cell parameters are

determined by illuminating the cells with radiation incident from at least three directions each being substantially more than 60° from one another, typically as a cone of radiation




having a solid angle of much greater than 90°. Such illumination serves to minimize variations, due to orientation, in the subsequent radiation emitted by the cell.

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**3,819,271**

**METHOD AND APPARATUS FOR MEASURING AGGLUTINATION OF CELLS IN A CARRIER LIQUID**

**Hartmut Beug, Tubingen-Buhl, and Gunther Gerisch, Tubingen, both of Germany, assignors to Max-Planck Gesellschaft Zur Forderung der Wissenschaften e.V., Gottingen, Germany**

**Filed Nov. 13, 1972, Ser. No. 305,941**

**Claims priority, application Germany, Nov. 15, 1971, 21566552**

**Int. Cl. G01n** *33/16, 21/24*

**U.S. Cl. 356—39** **10 Claims**

The agglutination of cells in carrier liquids is measured by enclosing the cell-carrying liquids in cuvettes having two opposite sides of flat glass and moving the cuvettes in a circular path while they are set into circumferential notches of a wheel rotated at uniform velocity. The cuvettes pass between a light source and a photoelectric cell equipped with slotted aperture plates in such a manner that the output of the photoelectric cell is a measure of the light scattered by the contents of each cuvette, and therefore of the number of cell aggregates in the carrier liquid. The light measurements may be made while the wheel rotates or after the wheel is stopped.

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**3,819,272**

**PROJECTIVE-REFLECTIVE OPTICAL APPARATUS**

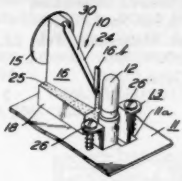
**David F. Crozier, Chester Springs, and Peter J. Bergman, Norristown, both of Pa., assignors to American Manufacturing Company, Inc., King of Prussia, Pa.**

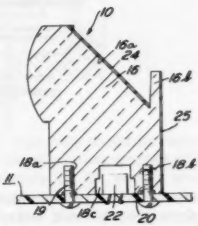
**Filed Mar. 29, 1973, Ser. No. 346,103**

**Int. Cl. G01b** *11/26*

**U.S. Cl. 356—138** **8 Claims**

An integral acrylic plastic body has a forward vertical lens portion attached to a vertical, generally trapezoidal transparent section having a rear, internally reflective surface. The unit is made for screw-mounting to a circuit board or the like. It contains an upwardly extending recessed portion on its bottom edge into which a light sensor may protrude to receive light reflected from the target through the lens onto the rear, internally reflective surface. An upward projection at the rear of the trapezoidal section is provided for proper positioning of




the unit relative to a light source. When the shadow of the upper edge of the projection on the external surface just behind the internal reflective surface is located at a predetermined point thereon, the light source is properly aligned.

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**3,819,273**

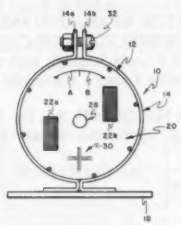
**LIGHT TARGET AND SENSOR**

**Norman P. Unema, Hudsonville, and James Stapert, Jr., Grand Rapids, both of Mich., assignors to Laser Alignment, Inc., Grand Rapids, Mich.**

**Filed Feb. 14, 1972, Ser. No. 225,894**

**Int. Cl. G01b** *11/26*

**U.S. Cl. 356—152** **22 Claims**




A plurality of light sensitive cells are positioned on a target face for receiving a moving beam of light from a light beam generator. The generator develops a datum plane of light. The cells are operatively associated with an electric circuitry connected to lights for translating visually whether the target is high, centered or low relative to the plane of light generated by the oscillating laser beam. The cells include portions offset from the other to permit independent or simultaneous interception thereof by the plane of light. The target by means of the light beam designates or depicts its position with respect to the plane of light intercepting the target either intermediate each cell, or on one or more of said cells. The target face is rotatable about an axis to adjust the positions of the cells relative to the plane of projected light thus providing a means for varying the high, centered or low reading produced by the target.

3,819,274

## METHOD OF READING AND INTERPOLATION FOR A PRECISION RULE AND APPARATUS FOR CARRYING IT OUT

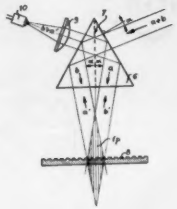
Maurice Koulicovitch, Geneva, and Jean Georgiou, Grand-Lany, both of Switzerland, assignors to Societe Genevoise D'Instruments De Physique, Geneva, Switzerland

Filed Feb. 5, 1973, Ser. No. 329,318

Claims priority, application Switzerland, Feb. 22, 1972, 2530/72; Nov. 6, 1972, 16112/72

Int. Cl. G01b 11/04

U.S. Cl. 356—170 2 Claims



The invention concerns a method of reading and interpolation for a precision rule wherein the spaces in the rule are compared with an interference pattern having a maximim pitch equal to the graduation of the rule, said method comprising the creation of a grating of interference fringes of equal thicknesses in the plane of the rule by the intersection of two beams of monochromatic light emanating from the same source and converging on the plane of the rule. The pitch of the fringes is set by the choice of the wave-length of the light and by the angle subtended by the axes of the said beams.

The invention concerns further an arrangement which comprises a Kosters prism, the semitransparent interface of which is disposed perpendicularly to the rule, a monochromatic light source illuminating one of the lateral faces of the prism and at least one photo-electric cell receiving the rays reflected by the rule.

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3,819,275

## TRANSLATOR FOR MEASURING AMOUNT OF COLOR CORRECTION FOR COLOR

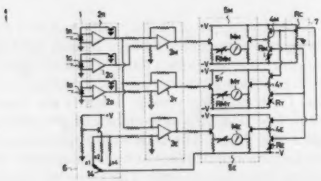
Mitsuo Aimi, and Kiyoshi Seigenji, both of Sakai, Japan, assignors to Minolta Camera Kabushiki Kaisha, Higashiku, Osaka, Japan

Filed Feb. 26, 1973, Ser. No. 337,232

Claims priority, application Japan, Feb. 29, 1972, 47-20774

Int. Cl. G01j 3/50

U.S. Cl. 356—175 9 Claims



A translator comprising a light receiving unit including three kinds of photocells having spectral sensitivities to red, green and blue colors respectively for receiving light from the optical projecting system of an enlarger equipped with color correction filters, arithmetic units for calculating ratios between the outputs of the photocells by taking one of the outputs as denomenators and the other two outputs as numerators respectively, comparison output setting units having their outputs determined only by the conditions of a negative previously memorized for comparison with the outputs from the arithmetic units respectively, and comparison units for comparing the outputs from the arithmetic units with the corresponding comparison outputs individually to indicate the differences therebetween, whereby the amount of color correction given only by the conditions of the negative is adjusted for the enlarger actually used for color printing.

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3,819,276

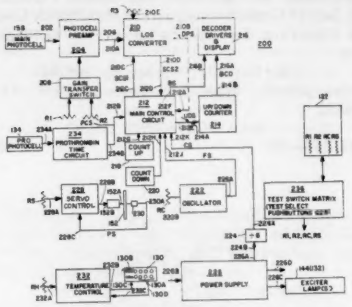
## DIGITAL DIRECT READING COLORIMETER

Raymond W. Kiess, and Peter H. Stewart, both of Miami, Fla., assignors to The First National Bank of Miami, Miami, Fla.

Continuation-in-part of Ser. No. 113,881, Feb. 9, 1971, Pat. No. 3,676,007, which is a continuation-in-part of Ser. No. 692,525, Dec. 21, 1967, Pat. No. 3,561,878. This application Feb. 8, 1972, Ser. No. 224,457

Int. Cl. G01j 3/42, 3/48

U.S. Cl. 356—184 20 Claims



A combined blood constituent and prothrombin time analyzer is provided in which a plurality of removable and replaceable circuit modules are utilized to program the analyzer for appropriate light wavelength, reagent blank offset, scale factors and calibration parameters and which is self referencing to predetermined standards such that the results derived are all normalized for readout on a common digital readout device. The entire analyzer is contained in a compact console which includes controlled incubated storage for blood test samples together with insertion cavities for both constituent concentration and prothrombin time analysis. The results of each analysis are so normalized by the blood analyzer that a common digital counter can be used to convert these results to a numerical readout presentable on a common readout device and said results are substantially instantaneously displayed subsequent to initiation of any given test in the analyzer.

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3,819,277

## PHOTOMETRIC ANALYZER HAVING TWO WAVELENGTHS FOR THE DETERMINATION OF ELEMENTS IN A SOLUTION

Guy Berthelot, Ivry sur Seine, and Jean Jacques Perez, Chatillon, both of France, assignors to Commissariat A L'Energie Atomique, Paris, France

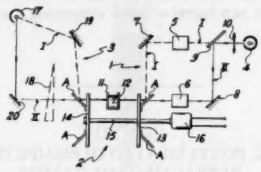
Filed Sept. 20, 1971, Ser. No. 181,734

Int. Cl. G01n 21/24

U.S. Cl. 356—204 6 Claims

The analyzer comprises a modulator-demodulator system disposed between an optical device which delivers two monochromatic beams having different wavelengths and a detection device which has at least one light detector and two optical paths.

A vessel containing the solution to be analyzed is placed between two plates secured to a motor-driven shaft and both provided with openings disposed in opposite relation. Inclined mirrors adjacent to each alternate opening are mounted in opposite relation in pairs on the outer faces of the plates and their reflecting faces are directed towards the plates.



During rotation of the plates about the shaft the two monochromic light beams pass in alternate sequence and along the same trajectory through the vessel which contains the solution to be analyzed and are then detected by said detection device after each beam has followed one of the optical paths.

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**3,819,278**

**TURBIDITY MEASURING DEVICE WITH MEANS FOR PREVENTING THE FORMATION OF BUBBLES**

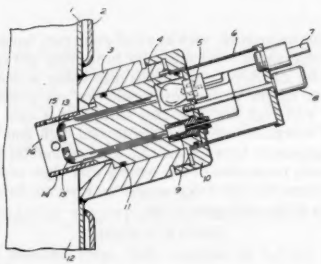
**Hans Muller, Im Almendli, Erlenbach, Zurich, Switzerland**

**Filed July 21, 1972, Ser. No. 274,064**

**Claims priority, application Switzerland, July 23, 1971, 11004/71; July 30, 1971, 11151/71**

**Int. Cl. G01n** *21/26*; **G01j** *3/46*

**U.S. Cl. 356—208** **7 Claims**



A culture vessel has an outer wall and is adapted to accommodate a substance whose turbidity is to be measured. A measuring unit for turbidity measurements is mounted on the outer wall and includes a light source and a photoelectric receiver which are located exteriorly of the vessel, and a light guide cooperating with the source and the receiver and extending into the interior of the vessel where portions of it define with one another a gap immersed in the substance so that light passes across this gap and will be influenced by the turbidity of the same. The portions of the light guide which are located in the vessel are surrounded by a sleeve which has an unobstructed open end and is provided with apertures in its circumferential wall.

**3,819,279**

**SAMPLE ATOMIZING DEVICE HAVING A RADIATION ABSORBING PROTECTIVE JACKET FOR FLAMELESS ATOMIC ABSORPTION SPECTROSCOPY**

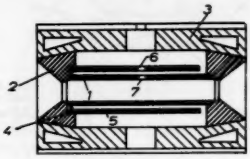
**Klaus Joachim Braun; Kurt Manthey; Klaus-Peter Rogasch, all of Uberlingen/Bodensee, and Rolf Gunter Arnold Tamm, Mimmenhausen, all of Germany, assignors to Bodenseewerk Perkin-Elmer & Co., GmbH, Bodensee, Germany**

**Filed Apr. 20, 1973, Ser. No. 353,088**

**Claims priority, application Germany, Apr. 21, 1972, 2219594**

**Int. Cl. G01n** *21/16*; **G01j** *3/30*

**U.S. Cl. 356—244** **7 Claims**



A known atomizing device, especially useful for atomizing the sample in a flameless atomic absorption spectrometer, includes a hollow body accommodating the sample which is heated electrically to a high temperature; this body is typically a graphite tubular sample cell which is heated up by applying a large current to its opposite ends. It is proposed to surround this body by at least one radiation absorbing (and therefore re-emitting) protective jacket, for example, a tubular member also made of graphite. This protective jacket reduces the amount of electric energy necessary to heat the body to a particular temperature since a substantial part of the radiation emitted from the body is absorbed and re-emitted back to the body by the protective jacket. In an alternative construction the protective jacket comprises a relatively deep layer of a porous material such as porous coal, so that the non-conducting pores cause the jacket to act substantially like a plurality of separate portions of concentric jackets.

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**3,819,280**

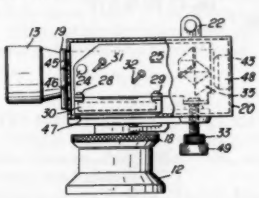
**OPTICAL SURVEYING INSTRUMENT**

**John Anthony Douglas Bruce Durham, London, England, assignor to National Research Development Corporation, London, England**

**Filed Jan. 4, 1972, Ser. No. 215,371**

**Int. Cl. G01c** *9/18*

**U.S. Cl. 356—249** **9 Claims**



Surveying instrument apparatus either in the form of the instrument itself or an attachment to an existing instrument, in which two optical paths are formed and a distant object is observed as two images superimposed on one another. One path is directly through, and at an acute angle to a part silvered mirror to give an upright image, while the second path involves reflection off three planar surfaces in three different planes to provide an inverted image by reflections from the part silvered mirror, with the objectives of the two paths laterally spaced. By coinciding the two images, rapid alignment and levelling of the instrument is possible with no eye strain.

**3,819,281**

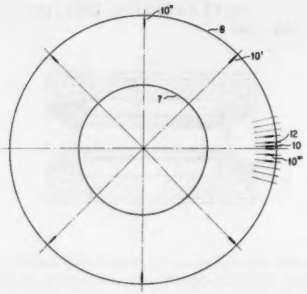
## INDEX-SECTOR DETECTION SCHEME FOR MAGNETIC DISC MEMORY

**Abul M. M. Hoque, Willingboro, N.J., and Michael J. Cullen, Hatfield, Pa., assignors to Sperry Rand Corporation, New York, N.Y.**

**Continuation of Ser. No. 212,202, Dec. 27, 1971, abandoned. This application June 14, 1973, Ser. No. 370,191**

**Int. Cl. G11b** *23/30*

**U.S. Cl. 360—51** **6 Claims**




There is disclosed herein a memory disc file arrangement for use with a movable head assembly wherein the bottommost disc is divided into a plurality of visible sector marks arranged around the periphery. One additional visible mark called the index is additionally provided and is located near the last sector mark. Both the index and sector marks are sensed optically. There is also disclosed a technique for determining when the speed of the disc has reached a first predetermined level which is below full speed. This first speed level is able to sustain the aerodynamic characteristics of the flying magnetic heads which are used in conjunction with the disc. The technique also enables the disc speed to be detected when it falls to a second predetermined level which is below the first level. The second speed level is not able to sustain the aerodynamic characteristics of the heads. The first and second speed determinations are utilized to produce signals for engaging and retracting the flying heads, respectively.

**3,819,282**

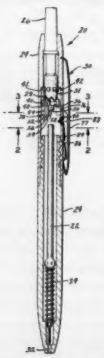
## RETRACTABLE PEN

**Hugo C. Schultz, Manchester, Mo., assignor to Penn Corporation, Princeton, N.J.**

**Filed Nov. 2, 1972, Ser. No. 303,265**

**Int. Cl. B43k** *5/16*

**U.S. Cl. 401—105** **9 Claims**



A pen having a writing unit slidably mounted in a barrel for protraction and retraction therefrom by a push button actuated protract-retract mechanism. The pen includes a deflectable spring mounted to a pocket clip and biased against the pen barrel such that a projecting member on the spring aligned with an opening in the barrel normally projects beyond the inner wall of the pen barrel for engagement with the protract-retract mechanism when the writing unit is in a protracted position. Deflection of the spring, as when the pen is clipped to a pocket, disengages the projecting member from the protract-retract mechanism to enable the writing unit to retract in the pen barrel without depressing the push button member.

**3,819,283**

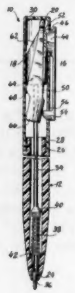
## WRITING INSTRUMENT WITH PROJECTING AND RETRACTING MECHANISM

**Albert Pulaski, Hollis, N.Y., assignor to K. C. Pen Co., Inc., Brooklyn, N.Y.**

**Filed June 5, 1972, Ser. No. 259,390**

**Int. Cl. B43k** *24/02*

**U.S. Cl. 401—106** **3 Claims**



A writing instrument, such as a ball-point pen, having a writing cartridge and a mechanism for projecting and retracting said writing cartridge, said mechanism being actuated by a pocket clip on the writing instrument and comprising a cam element with high and low cam faces and a cam follower which is alternately engageable with said high and low cam faces, engagement between the cam follower and the high cam face causing projection of the writing cartridge, and engagement between the cam follower and the low cam face causing retraction of the writing cartridge.

**3,819,284**

## WRITING INSTRUMENT

**Erwin Kreuzer, Am Schlossbach 40, 5300 Bonn-Rottgen, Germany**

**Filed Feb. 9, 1973, Ser. No. 331,043**

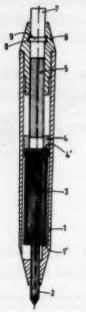
**Claims priority, application Germany, Feb. 21, 1972, 2208111**

**Int. Cl. B43k** *5/10, 8/00*

**U.S. Cl. 401—151** **9 Claims**

An ink writing instrument has a fibre-tipped writing point in communication with a wick-like ink reservoir housed in the instrument body, which also encloses another ink reservoir holding a reserve supply of ink, for emptying into the first ink

reservoir when the latter is exhausted, emptying of the reserve ink reservoir being achieved by pushing inwardly a slidably



mounted plunger which protrudes from the body, the position of the plunger outside the body indicating whether or not the reserve ink reservoir has been emptied.

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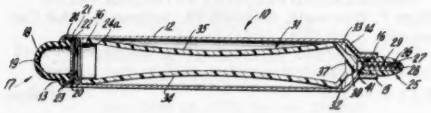
**3,819,285**
**PRESSURIZED MARKING DEVICE**

**Francis W. Andrews, Clarcona; Philip S. Sussman, Orlando, both of Fla., and Sidney D. Barlow, Mount Vernon, N.Y., assignors to Mark-Tex Corporation, Englewood, N.J.**

**Filed Feb. 22, 1973, Ser. No. 334,730**
**Int. Cl. B43k** *1/08*
**U.S. Cl. 401—190** **12 Claims**



A marking device includes an ink container in which the ink is placed under gas pressure to cause it to flow. The marking device includes a valve-type nozzle, which is a tubular member having an internal spring loading a ball valve, and a secondary spring valve, which closes the container upon removal of the valve-type nozzle.

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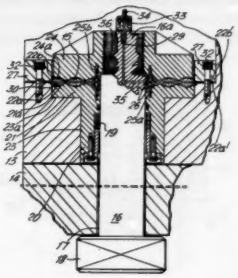
**3,819,286**
**HYDRAULIC TIGHTENING-UP DEVICE FOR VERY HIGH STRESSES**

**Turreno Bianchi, Terni, Italy, assignor to S.A.I.P. (S.p.A.), Terni, Italy**

**Filed Nov. 1, 1971, Ser. No. 194,297**
**Int. Cl. F16b** *5/04*
**U.S. Cl. 403—31** **7 Claims**

A hydraulic tensioning device for securing together two plate elements initially in contact with each other, but which tend to separate under the effect of working stresses, comprising a rod, passing through both plates, having an enlarged head which engages the outer surface of the second plate. At the other end of said rod, a cap is mounted which abuts against the outer surface of the first plate. Interposed between the cap and the first plate is a device of variable volume, which includes a substantially closed annular chamber defined by flexible metallic walls which can be strained at least in the direction of the axis of said rod. Means connected to a fluid source are provided for supplying a pressurized fluid into said chamber in order to maintain the tension on the rod and thus



the seal connection between the two plates despite the tendency of the two plates to separate during the application of the working stresses.

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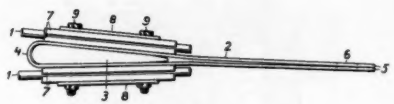
**3,819,287**
**WEDGE-TYPE HOLDING DEVICE**

**Nils Rune Axelsson, Kallhall, and Sven Gunnar Wretemark, Stockholm, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden**

**Filed Sept. 1, 1972, Ser. No. 285,754**
**Claims priority, application Sweden, Sept. 13, 1971, 11564/71**
**Int. Cl. F16g** *11/04*
**U.S. Cl. 403—211** **4 Claims**



The invention relates to a wedge-type holding device for use in the suspension of an aerial cable with at least two supporting parts. The holding device comprises a cable holder in which a clamp has clamping surfaces diverging in the pulling direction of the aerial cable. Two pairs of jaws are fixed between the clamping surfaces and are adapted for clamping the parts of the aerial cable. A bar, which has a wedge shape diverging in the pulling direction of the aerial cable, is displacably arranged between the pairs of jaws.

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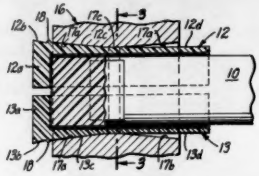
**3,819,288**
**ADAPTER FOR FIBERGLASS TOOL HANDLES AND OTHER FIBERGLASS CONNECTIONS**

**Joseph Allen Carmien, Sun Valley, Calif., assignor to Nupla Corporation, Sun Valley, Calif.**

**Continuation-in-part of Ser. No. 221,615, Jan. 28, 1972, Pat. No. 3,753,602. This application Jan. 2, 1973, Ser. No. 320,554**
**Int. Cl. B25g** *3/24*
**U.S. Cl. 403—247** **10 Claims**

An adapter for connecting tool heads to fiberglass tool handles and for making other fiberglass attachments. An adapter which is preferably formed in two sections is mounted around and over the end of the tool handle. Interlocking means or frictional engagement are provided to hold the adapter in place. The upper portions of the exterior walls of the adapter sections are tapered complementarily to the inwardly tapered upper section of a conventional double tapered tool head opening and are adapted to make frictional engagement

therewith. The adapter is capable of being cold molded to a limited degree to make a locking engagement with the tool head adjacent to the midportion of the tool head opening. A



plurality of spacers are removably mounted in the adapter sections to compensate for variations in the tool head opening. Molded inserts are also provided so that a single adapter can be used on two different standard sizes of tool handles.

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**3,819,289**

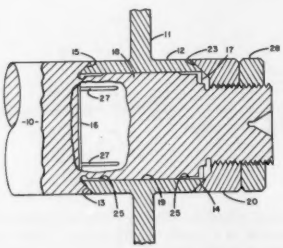
**STRUCTURE FOR DETACHABLY SECURING A MEMBER CONCENTRICALLY TO A HIGH SPEED SHAFT**

**Alexander A. Carroll, Greensburg, Pa., assignor to Carrier Corporation, Syracuse, N.Y.**

**Filed Sept. 1, 1972, Ser. No. 285,707**

**Int. Cl. F16d** *1/06*

**U.S. Cl. 403—259** **4 Claims**



A functional member, such as a thrust collar, is formed with a hub having a bore for a light push fit on a shaft journaled for high speed rotation. The annular end surfaces of the hub are beveled outwardly toward the center of the hub. A shoulder surface is fixed to the shaft for engagement by one end surface of the hub. Hub engaging means, having a threaded connection with the shaft, is provided for engaging the opposite ends of the hub and, by virtue of the threaded connection with the shaft, is movable axially of the shaft whereby the hub is forcibly clamped between the fixed shoulder on the shaft and the hub engaging means and is maintained in concentric relation to the shaft.

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**3,819,290**

**BRACE FOR RIGIDIFYING JOINTS BETWEEN ELONGATED STRUCTURAL MEMBERS**

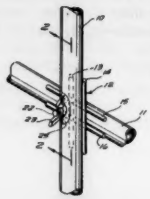
**Victor Plotkin, Brooklyn, N.Y., assignor to Spiegel Industries Corporation, Teaneck, N.J.**

**Filed Jan. 29, 1973, Ser. No. 327,330**

**Int. Cl. A47f** *7/18*

**U.S. Cl. 403—388** **9 Claims**

A brace comprising two pair of spaced apart parallel rods welded together in a "tic-tac-toe" pattern. The brace is located between two crosss elongated structural members, each pair of rods cradling one of the members. A bolt extends



through aligned holes in the members and is secured by a nut to join the two members and the brace together in a rigid joint.

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**3,819,291**

**METHOD OF MAKING A PAVEMENT**

**Kenneth E. McConnaughay, P.O. Box 1457, Lafayette, Ind. 47902**

**Filed May 20, 1970, Ser. No. 38,867**

**Int. Cl. E01c** *7/26*

**U.S. Cl. 404—75** **1 Claim**

A method of making a pavement in which a bituminous binder is mixed with an aggregate and the mixture is compacted to form a pavement. A layer of fibers is then spread over said pavement in the form of a slurry of a mixture of water and a fibrous material and forced into the upper surface thereof to thus form a pavement surface having said fibers embedded in its upper surface.

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**3,819,292**

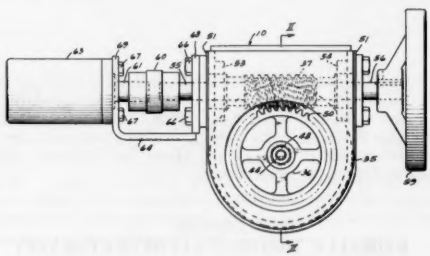
**PROGRAMMED PRESSURE EXTRUDER VALVE**

**William P. Wentworth, Rockford, Ill., assignor to Beloit Corporation, Beloit, Wis.**

**Filed Nov. 10, 1972, Ser. No. 305,222**

**Int. Cl. F01d** *17/20;* **F16d** *31/04*

**U.S. Cl. 415—150** **13 Claims**



Automatic extruder valve for hot melt plastic including a housing having a barrel chamber with an inlet passageway leading into the barrel chamber and an outlet passageway leading from the barrel chamber with a screen and breaker plate separating the inlet from the outlet passageway. The inlet passageway has a diverging discharge end forming a tapered valve seat cooperating with the tapered metering valve element, to maintain a programmed pressure in the extruder chamber. A reversible motor moves the valve element in and out along the valve seat through a geared drive connection. A pressure sensing transducer in the inlet passageway controls operation of the motor to effect movement of the valve in and out in accordance with flow requirements to match the pressure setting of a pressure setting control.

## 3,819,293
## CENTRIFUGAL PUMP FOR CORROSIVE LIQUIDS

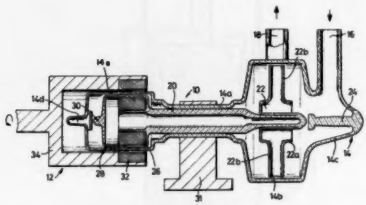
**Fritz Zitzmann, Garching, Germany, assignor to Max-Planck-Gesellschaft Zur Forderung der Wissenschaften e.V., Gottingen, Germany**

**Filed June 6, 1972, Ser. No. 260,291**

**Claims priority, application Germany, June 7, 1971, 2128265**

**Int. Cl. F04d** *29/42*; **F04h** *17/00*

**U.S. Cl. 415—200** **10 Claims**



There is described a centrifugal pump having a sealed glass housing provided with an inlet and an outlet, a glass shaft disposed in the housing and rotatably supported by a cylindrical wall portion thereof, an impeller fastened to one end of the shaft and a ferromagnetic body fastened to the other end of the shaft within a sealed jacket thereof. The pump is associated with external means that generate a rotary magnetic field which, by virtue of its interaction with said ferromagnetic body, causes rotation of the shaft.

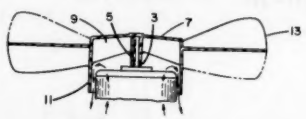
## 3,819,294
## FAN CONSTRUCTION

**Fred V. Honnold, North Syracuse, and William C. Martin, Jr., Syracuse, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.**

**Filed May 25, 1972, Ser. No. 256,699**

**Int. Cl. F04d** *29/32*

**U.S. Cl. 416—93** **1 Claim**



A propeller type fan adapted to be self locating on a fan motor shaft including means to protect the motor and shaft from deleterious atmospheric conditions and circulate air through the motor and around the exterior thereof for improved motor cooling.

## 3,819,295
## COOLING SLOT FOR AIRFOIL BLADE

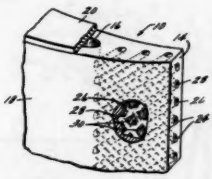
**Ambrose A. Hauser, Cincinnati; Terry T. Eckert, Mt. Healthy, and James D. McDonel, Loveland, all of Ohio, assignors to General Electric Company, Cincinnati, Ohio**

**Filed Sept. 21, 1972, Ser. No. 291,005**

**Int. Cl. F01d** *5/18*

**U.S. Cl. 416—97** **4 Claims**

A cooling slot for passing cooling fluid through a heated plate such as an airfoil blade for use in gas turbine engines is created by forming a first plurality of passages within the blade, and then forming a second plurality of passages within the blade, wherein preselected of the passages of the second plurality intersect at least one of the passages of the first plurality to define a number of nodes between the points of intersection. When cooling fluid is passed through the blade, the



nodes act as turbulence promoters and area increasers for improving convective heat transfer between the blade and the cooling fluid.

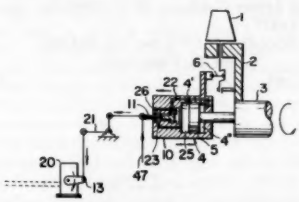
## 3,819,296
## CONTROL FOR HYDRAULIC MACHINE HAVING ADJUSTABLE BLADES

**Hiroshi Sugano; Ken Tsushima; Kurayoshi Sato, and Noboru Araikawa, all of Nagasaki, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Mar. 6, 1972, Ser. No. 232,090**

**Int. Cl. B63h** *3/02*

**U.S. Cl. 416—157** **8 Claims**



The pitch of blades in a fan is varied by means of a hydraulic servo mounted in the runner. A pilot valve controls a supply of oil under pressure to the hydraulic servo. The casing of the pilot valve is mounted to the blade actuating member of the hydraulic servo. The casing is preferably made integral with either the cylinder or the piston of the hydraulic servo.

## 3,819,297
## CENTRIFUGAL PUMP ASSEMBLY

**Robert D. East, Kalamazoo, Mich., assignor to General Gas Light Company, Kalamazoo, Mich.**

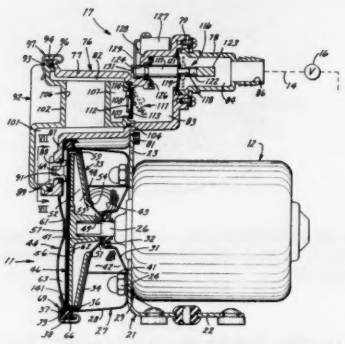
**Filed Sept. 11, 1972, Ser. No. 287,747**

**Int. Cl. F04b** *49/02*

**U.S. Cl. 417—38** **9 Claims**

A fluid delivery system, particularly suitable for vehicles for pumping water from a supply tank, and including a centrifugal pump and a motor for driving same. A pressure and flow sensitive control device associated with the water as discharged from the pump controls a switch which activates the motor, whereby the motor and pump are energized and de-energized in response to the movements of the control device, which control device in turn is moved in response to the external demand for water. The pump housing has a removable end cover which is secured to the housing by resilient releasable clips, which clips permit the end cover to be partially or totally released from the housing when a predetermined force is developed internally of the housing, such as caused by freez-

ing of the water within the housing. A control plate is disposed closely adjacent the discharge side of the rotor for preventing the pressurized fluid from intimately contacting and applying



a large axially directed force to the rotor, thereby effectively isolating the pressurized discharged fluid from the rotor to thus minimize rotor wear.

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**3,819,298**

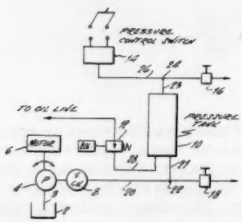
**CHEMICAL INJECTION SYSTEM**

**Thomas D. Hadnagy, 17 Briar Ln., Roslyn Heights, N.Y. 11577, and Arthur Goldberg, 88-04-209th St., Queens Village, N.Y. 11427**

**Filed Oct. 2, 1972, Ser. No. 293,944**

**Int. Cl. F04b** *49/02*

**U.S. Cl. 417—44** **2 Claims**




A chemical injection system and circuitry therefor including a pressure tank, a pump to supply chemicals to the pressure tank, a pressure control switch to regulate the pressure within the pressure tank, and a cam operated solenoid valve to regulate chemical injection from the pressure tank.

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**3,819,299**

**MAGNETOCALORIC PUMP**

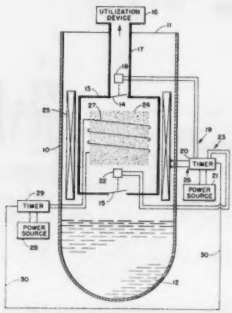
**Gerald V. Brown, Lakewood, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.**

**Filed Nov. 10, 1972, Ser. No. 305,639**

**Int. Cl. F04b** *19/24*

**U.S. Cl. 417—52** **18 Claims**

A pump for fluids is disclosed. A vessel having inlet and outlet valves is disposed in a container having disposed therein a fluid to be pumped and which fluid may be evolved from a liquid in the container below the vessel. A magnetocaloric substance is disposed in the vessel and causes fluid vapor in the vessel to expand and be expelled through the outlet valve when a magnetic field is impressed on a magnetocaloric substance of the type which increases in temperature when subjected to an increasing magnetic field. If the magnetocaloric substance is of a type which increases in temperature when subjected to a decreasing magnetic field, then fluid will be expelled from the vessel when the magnetic field is decreased or terminated. As the substance cools, vapor is drawn in through the inlet valve. The inlet valves may be one-way check valves or may be solenoid valves energized at appropriate times by timing circuits. A timer controlled heating element may also be disposed in the vessel to operate in conjunction with the magnetic field.

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**3,819,300**

**VALVE AND DOSAGE APPARATUS**

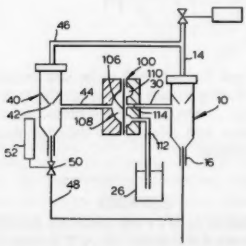
**Ernest Holger Bertil Nystroem, P.O. Box 7, 1195 Bursinel, Dully, Bursinel Vaud, Switzerland**

**Filed Oct. 12, 1972, Ser. No. 297,116**

**Claims priority, application Great Britain, Oct. 12, 1971, 47385/71**

**Int. Cl. F04f** *5/48*

**U.S. Cl. 417—191** **7 Claims**

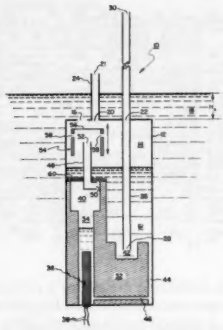


The present invention relates to a valve comprising a compartment, a duct extending through, but not communicating with, said compartment, said duct having at least a portion within said compartment which is deformable and said compartment being selectively connectible with means for presurising said compartment and means for depressurising said compartment. The valve may be used for example as part of a dosing apparatus.

## 3,819,301
## SINGLE VALVE VAPOR PUSH PUMP

**Heinz Jaster, Schenectady, and Philip G. Kosky, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.**

**Filed Nov. 29, 1972, Ser. No. 310,662**
**Int. Cl. F04b *19/24*; F04f *1/18***
**U.S. Cl. 417—209** **6 Claims**

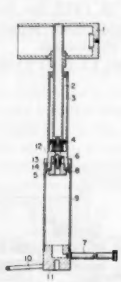


Herein disclosed is a pump comprising a chamber including a liquid inlet port. Located within the chamber are: a buoyant valve, responsive to liquid level and vapor pressure within the chamber to open or close said port; a cartridge heater for vaporizing part of the liquid in the chamber; and, a liquid delivery conduit extending from within said chamber to the outside thereof. The heater vaporizes some of the liquid in the chamber and the vapor pressure thereof pushes liquid through the conduit.

## 3,819,302
## PUMP PARTICULARLY FOR BICYCLES

**Isao Ohashi, Nagoya, Japan, assignor to Ohashi Iron Works Co., Ltd., Aichi, Japan**

**Filed Apr. 19, 1973, Ser. No. 352,492**
**Claims priority, application Japan, May 17, 1972, 47-57745**
**Int. Cl. F04b *21/00***
**U.S. Cl. 417—234** **1 Claim**

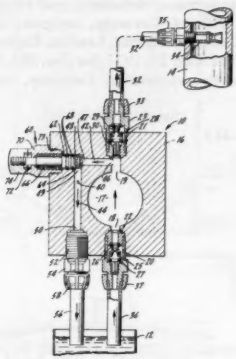


The present invention is a built-up pump for bicycles. The pump consists of a tank provided with a hose, a cylinder which can be placed in the tank, when not used, or extended above the tank, when used, a piston rod which has a piston on the lower end and can accommodate the hose in its hollow portion. A handle is capable of being fit onto the outside of the tank, when not used, and used as a handle to operate the piston rod.

## 3,819,303
## RELIEF-RELEASE PUMPS

**Robert K. Pfleger, Miami, Fla., assignor to Ecodyne Corporation, Chicago, Ill.**

**Filed June 13, 1973, Ser. No. 369,699**
**Int. Cl. F04b *49/08***
**U.S. Cl. 417—305** **7 Claims**

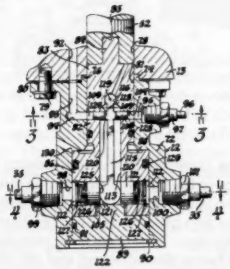


A chemical feed pump which includes a pump head having an inlet check valve, a discharge check valve, a return check valve, a relief-release means, a pumping chamber, and a connecting passageway. The relief-release means includes a plunger member having a seal insert member offixed to its face and held in closing relationship to the connecting passageway through the action of a spring. The spring is mechanically held toward the pump head by a cap which has a set of inclined planes on its outward surface. A control knob is attached to the outward end of the plunger. The knob has a set of inclined planes facing the planes on the cap such that by rotating the knob the inclined planes will cause the spring to be compressed as they pull the plunger with its affixed seal insert away from the connecting passageway. When the plunger with the affixed seal insert is moved away from the connecting passageway, the pumping chamber is in fluid communication with the return check valve.

## 3,819,304
## OIL METERING PUMP

**Theodore E. Demers, Ann Arbor, Mich., assignor to General Motors Corporation, Detroit, Mich.**

**Filed Apr. 26, 1973, Ser. No. 354,701**
**Int. Cl. F16n *13/16***
**U.S. Cl. 417—375** **3 Claims**



An oil metering pump metering oil to lubricate gas seals in a rotary engine has a rotor member that is driven by the engine

and carries a fuel plunger which is reciprocated by fuel flow to the engine during rotor rotation and operates through a lever to reciprocate an oil plunger to meter oil for gas seal lubrication in proportion to the amount of fuel being used.

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**3,819,305**

**LIQUID PRODUCT CONTROL SYSTEM**

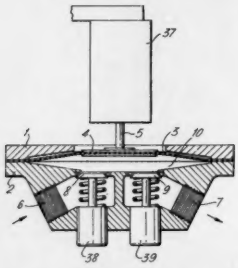
**Karl Heinz Klochemann, Steinkamp, and Frank Wurzbacher, Kolberger, both of Germany, assignors to The British Petroleum Company Limited, London, England**

**Filed Aug. 24, 1972, Ser. No. 283,373**

**Claims priority, application Germany, Aug. 27, 1971, 2142956**

**Int. Cl. F04b** *43/00*

**U.S. Cl. 417—413** **3 Claims**



A liquid product control system uses a pulse generator to drive a meter. Variation in flow rate is achieved by suppressing blocks of pulses. Operating pulses continue at the same frequency as they are generated and alternate with periods when all pulses are suppressed. An indicator is activated by a separate train of pulses generated by the meters.

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**3,819,306**

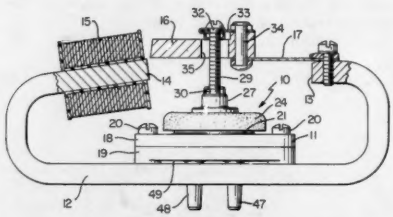
**VALVE MEANS FOR A FLUID PUMP OR THE LIKE AND METHOD OF MAKING SAME**

**William J. Russell, Malvern, Pa., assignor to Robertshaw Controls Company, Richmond, Va.**

**Filed Sept. 27, 1972, Ser. No. 292,646**

**Int. Cl. F04b** *39/10*

**U.S. Cl. 417—566** **6 Claims**



A fluid pump construction having a pump body. A valve chamber formed in the pump body with the pump body having an annular valve seat projecting into the chamber and an annular rib means also projecting into the chamber and facing the annular valve seat. A flexible valve member is disposed in the chamber between the valve seat and the rib means in such a manner that the rib means causes the valve member to be biased against the valve seat to close the same as the rib means flexes and tends to hold the valve member in substantially a conical configuration that is adapted to engage the valve seat and be traversed by the plane of the valve seat.

**3,819,307**

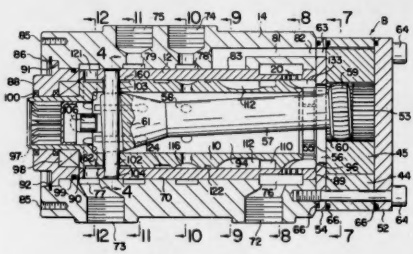
**STABILITY MEANS FOR A CONTROLLER FOR FLUID PRESSURE OPERATED DEVICES**

**Sohan L. Uppal, Hopkins, Minn., assignor to Eaton Corporation, Cleveland, Ohio**

**Filed Oct. 24, 1972, Ser. No. 300,037**

**Int. Cl. F01c** *1/02*; **F03c** *3/00*; **B62d** *5/00*

**U.S. Cl. 418—61 B** **14 Claims**



An improved, stabilizing means for a controller operatively connected to a servomotor for controlling flow to a fluid pressure device. In a neutral position, a plurality of flow control ports in first and second valve members, one member disposed within the other, are in registry with one another to direct inlet pump flow to an outlet. In an actuated position, the flow control ports are positioned a predetermined degree out of registry as one valve member is rotated relative to the other to thus communicate inlet fluid to the servomotor and metered fluid from the servomotor to the fluid pressure device.

The improved stability means dampens the sudden pressure changes within the modulating range as the controller is moved from one position to another. More particularly the stabilizing means comprises an orifice arrangement for augmenting flow which is disposed relative to certain flow control ports in one valve member to control the flow area into flow ports of the second member upon relative movement of the valve members.

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**3,819,308**

**AIR PUMPS FOR AN ENGINE EXHAUST GAS CLEANING SYSTEM**

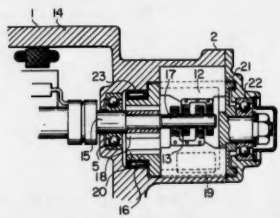
**Shinya Ishihara, and Yoshihiro Suzuki, both of Anjo, Japan, assignors to Nippondenso Co., Ltd., Aichi-ken, Japan**

**Filed Oct. 20, 1972, Ser. No. 299,450**

**Claims priority, application Japan, Nov. 1, 1971, 46-101870; Nov. 9, 1971, 46-104460**

**Int. Cl. F01c** *13/00*

**U.S. Cl. 418—181** **5 Claims**



An air pump constructed as a unit with a generator having a generator shaft, said air pump having a vane shaft integrally formed with the generator shaft and a rotor provided with an

internal gear, said vane shaft being provided with a pinion meshing with said internal gear, whereby said rotor is rotated at a reduced speed as compared with the generator shaft.

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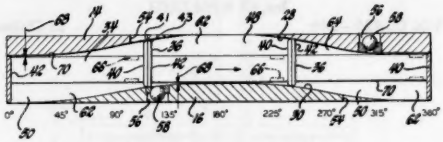
**3,819,309**

## MEANS FOR ALTERING THE EFFECTIVE DISPLACEMENT OF AN AXIAL VANE COMPRESSOR

**James W. Jacobs, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.**

**Filed Oct. 11, 1972, Ser. No. 296,563**
**Int. Cl. F04c *1/00***
**U.S. Cl. 418—219** **3 Claims**



In preferred form an axial vane compressor including a housing enclosed by end plates having inner face cam surfaces and rotatably supporting a drive shaft. A rotor is secured to the drive shaft for rotation therewith within the housing between the cam surfaces of the end plates. A specified axial clearance is provided between the rotor and the cam surfaces at their areas of closest proximity. The rotor contains at least one axially extending slot slidably receiving an axially slidable pumping vane. The vane terminates in arcuate edge surfaces in sliding engagement with the end plate cam surfaces and is moved axially by the cam surfaces relative to the rotor during rotation thereof so as to vary the effective volume in fluid working chambers on either side of the rotor as the rotor rotates through inlet and pressurization cycles. In this manner the vane draws in and compresses fluids in the respective work chambers. The rotor is provided with axially aligned cavities in the opposite faces of the rotor having predetermined volumes so that the effective displacement of the rotor in each of the aforementioned work chambers is regulated in accordance with the size of these cavities. This regulation occurs as a result of a predetermined volume of pressurized fluid being carried by the cavities into the intake cycle as the rotor rotates from the pressurization cycle. The clearance between the rotor and the cam surfaces allows this portion of the pressurized fluid to flow against the vanes assisting rotation of the rotor. Therefore, the provision of the rotor cavities and the clearance between the rotor and the cam surfaces results in recapturing some of the work used to pressurize the portion of the fluid carried forwardly into the intake cycle. By providing cavities of a predetermined size in the rotor surfaces an axial vane compressor can be suited to a range of applications such as occurs in air conditioning systems in compact vehicles as compared to similar systems in large vehicles.

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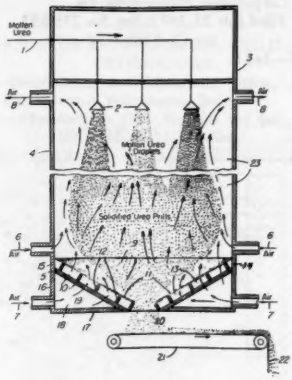
**3,819,310**

## APPARATUS FOR PRILLING UREA

**Ivo Mavrovic, 530 E. 72nd St., New York, N.Y. 10021**

**Continuation-in-part of Ser. No. 104,998, Jan. 8, 1971, abandoned. This application May 22, 1972, Ser. No. 255,726**
**Int. Cl. B29c *23/00***
**U.S. Cl. 425—6** **19 Claims**

Urea is prilled by spraying urea droplets downwardly into a solidification zone where it is contacted with a substantially inert gas. Prills are directed into a collector by diverting their flow by directing a gas through a perforated, inverted cone or




pyramid located at the bottom of and in communication with said zone.

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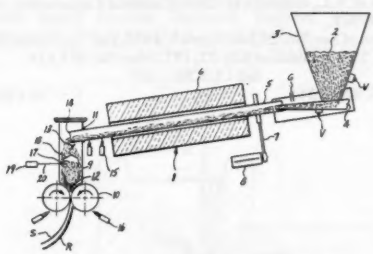
**3,819,311**

## APPARATUS FOR FORMING MULTI-PHASE STRIP FROM PARTICLE AND POWDER MIXTURE

**Werner G. Horn, Cheshire, and Robert M. Neumann, New Haven, both of Conn., assignors to Olin Corporation, New Haven, Conn.**

**Division of Ser. No. 137,489, April 26, 1971, Pat. No. 3,713,474. This application June 16, 1972, Ser. No. 263,607**
**Int. Cl. B22f *3/00***
**U.S. Cl. 425—78** **12 Claims**

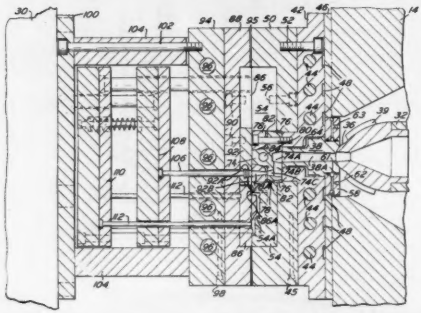


An article or strip formed by compacting coarse metal particles or a mixture of coarse metal particles and a fine powder. The invention is particularly directed to the formation of multi-phase strip having a matrix formed of compacted coarse metal particles and at least one second phase formed of a compacted powder. The apparatus and process of forming the strip are also part of the invention. The particles have a diameter of 150 to 1,200 microns and, preferably, have a length-to-diameter ratio of 3:1 to 10:1. The powder material has a diameter of less than 50 microns. Particle size and density segregation effects are minimized by adding powder to the particles at a point in close proximity to the compacting means. The invention is particularly applicable to copper and copper base alloys and is uniquely suited to produce anode matrix combinations in accordance with U.S. Pat. No. 3,574,081.

## 3,819,312
## COLD RUNNER INJECTION MOLD FOR THERMOSETTING RESINS

**Vasken Frank Arpajian, Huntingdon Valley, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.**

**Filed July 25, 1972, Ser. No. 275,032**
**Int. Cl. B28b** *1/24*
**U.S. Cl. 425—242 R** **9 Claims**

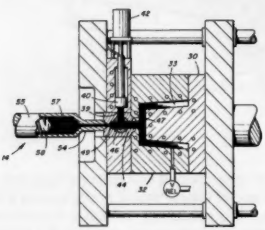


A cold runner mold for injection molding of articles from thermosetting resins includes a relatively cool centrally disposed sprue passage which is thermally insulated from the hot cavity sections by air gaps. A transition zone between the cold runner section and the cavities is provided by a series of conical canals, one for each mold cavity, leading from the cool sprue passage and converging into hot wells in communication with the respective mold cavities at the mold parting line.

## 3,819,313
## APPARATUS FOR MOLDING ARTICLES

**Roy C. Josephsen, Hillsdale, and Clifford L. Weir, Wayne, both of N.J., assignors to Allied Chemical Corporation, New York, N.Y.**

**Division of Ser. No. 25,140, April 2, 1970, Pat. No. 3,694,529. This application July 27, 1972, Ser. No. 275,616**
**Int. Cl. B29c** *1/00*
**U.S. Cl. 425—244** **10 Claims**

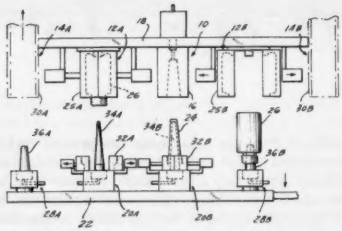


This disclosure is directed to a method of and apparatus for injection molding. Shot capacity of injection molding machines is increased by providing a low pressure accumulator which can receive a first charge of prepared molding material from a preparation chamber so as to store the first charge during the preparation of a second charge in the preparation chamber. Upon the completion of the preparation of the second charge, both the first charge from the accumulator and the second charge from the preparation chamber are injected into a mold cavity. Molding with foamable molding material is improved by communicating the accumulator with the mold cavity so as to allow expansion of the foamable molding material into the accumulator from the mold cavity during foaming. Material so received within the accumulator is thereafter recompressed for use as all or part of the first charge for the next subsequent molding cycle.

## 3,819,314
## LINEAR TRANSFER INJECTION BLOW MOLDING

**Paul Marcus, 85 Pascack Rd., Pearl River, N.Y. 10965**

**Filed May 31, 1972, Ser. No. 258,244**
**Int. Cl. B29d** *23/03*
**U.S. Cl. 425—249** **15 Claims**

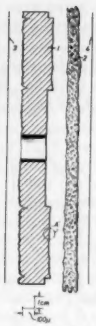


An injection blow molding machine for molding plastic receptacles is provided with a clamping plate on which is mounted a parison mold, a pair of split blow molds, one on each side of the parison mold and in line therewith, together with a pair of receptacle ejection or removing stations similarly arranged and in an in-line relationship. A second indexing plate is arranged in space relationship to the clamping plate and on which four in-lined core rod assemblies are mounted. The indexing plate is reciprocal towards and away from the clamping plate; and, at the same time, the indexing plate is reciprocal laterally in a plane parallel to the clamping plate. As a result of this relative linear motion, the two inner core rod assemblies are adapted to be sequentially coupled with the parison mold in forming the parison. This parison is adapted to be transferred while on the core rod assembly to a blow mold while the other core rod assembly of the central pair is then coupled with the parison mold. A split neck mold may form part of the inner pair of core rod assemblies for purposes of forming a threaded neck on the parison. The parison transferred to the blow mold is blown into the selected configuration against the cavity walls and the plastic is oriented for purposes of maintaining this configuration. When this orientation has been accomplished, the two inner core rod assemblies are reciprocated back to their original position at which the parison on the other core rod assembly is transferred to the other blow mold while the core rod associated with the blown parison is stripped therefrom and returned to the injection mold. During this lateral reciprocation, one of the two outer core rod assemblies is coupled with the blown plastic parison. Cooling air is passed through this core rod assembly to cool the blown parison. The introduced cooling air is adapted to bleed between the neck opening and the associated core rod which is preferably formed of relatively soft material. The other core rod of relatively soft material will have reciprocated from its associated blow mold to the neighboring ejection station. At this station, the cooled blown parison forming the finished receptacle will be removed from this core rod and transferred to the selected packaging station.

## 3,819,315
## APPARATUS FOR STAMPING INFORMATION CARRIERS FROM A PLASTIC FOIL

**Heinz Borchard, Nortorf; Robert Kasch, Alt Muhlendorf Bei Nortorf, and Bruno Rybka, Nortorf, all of Germany, assignors to Ted-Bildplatten Aktiengesellschaft Aeg-Telefunken-Teldec, Zug, Switzerland**

**Filed Jan. 9, 1973, Ser. No. 322,153**
**Int. Cl. B29d** *17/00*; **B29c** *17/00*
**U.S. Cl. 425—383** **12 Claims**

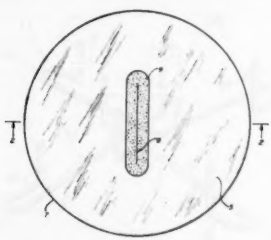


In apparatus for stamping foils with a relief pattern, employing a resilient buffer pad to press the foil to be stamped against the matrix carrying the negative of the relief pattern, the buffer pad includes a plastic surface layer slidably disposed on a rubber elastic pad. This plastic layer provides the outer surface of the buffer pad which presses against the foil. In order to enable the plastic layer to be able to more easily slide over the rubber elastic pad, a slide layer is placed between the two layers. This slide layer can consist of a silicone paste. The buffer pad is outwardly bulged toward the foil when initially coming into contact with the foil and then as the buffer pad presses the foil against the matrix the buffer pad is flattened. To increase the ability of the buffer pad to be bulged in this manner, the buffer pad is placed upon a plastic pad which preferably consists of two plastic layers.

## 3,819,316
## PIE CRUST FORM

**George B. Davis, Jr., 7512 Marbury Rd., Bethesda, Md. 20658**

**Filed Nov. 17, 1972, Ser. No. 307,535**
**Int. Cl. A23p** *1/00*
**U.S. Cl. 425—470** **7 Claims**

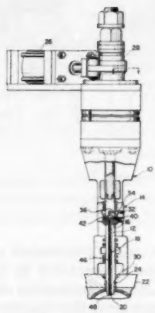


This invention relates to a pie crust forming or working device and particularly to an inexpensive disposable type of such device designed primarily for inclosing within the container of a conventional pie crust mix and which will enable even the most novice of pie crust makers to produce in a matter of minutes a perfect crust both as to diameter and thickness without the usual cleanup mess that accompanies the crust rolling operation.

## 3,819,317
## APPARATUS FOR BLOW MOLDING AND INJECTING COOLING GAS

**Lloyd D. Higginbotham, Williamston, Mich., assignor to Haskon Incorporated, Wilmington, Del.**

**Filed Oct. 30, 1972, Ser. No. 301,948**
**Int. Cl. B29c** *17/07, 17/12*
**U.S. Cl. 425—387 B** **4 Claims**

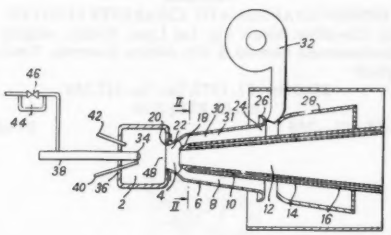


A blow head assembly for a blow molding machine having a rotating blow pin and a mechanism for simultaneously injecting cooling gas and air into the interior of the parison.

## 3,819,318
## PULSATING COMBUSTORS

**Ronald Denzil Pearson, Bathford, England, assignor to Babcock & Wilcox Limited, London, England**

**Filed Apr. 24, 1973, Ser. No. 354,132**
**Int. Cl. F23c** *3/02*
**U.S. Cl. 431—1** **20 Claims**

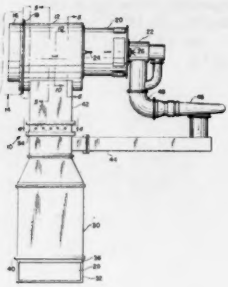



A pulse combustion installation including a combustion chamber closed at one end and provided with a neck at the other end with an outlet duct extending therefrom. An inlet duct extending convergently to the neck and being co-axial and partly coextensive with the outlet duct at the neck. The inlet and outlet ducts and combustion chamber being of such length as to produce resonant conditions upon combustion of fluent fuel within the combustion chamber.

## 3,819,319
## INDUSTRIAL POLLUTION CONTROL SYSTEMS AND COMPONENTS THEREOF

**Robert E. Schreter, Lebanon, Pa., assignor to Hauck Manufacturing Company, Lebanon, Pa.**

**Continuation-in-part of Ser. No. 314,741, Dec. 13, 1972. This application Aug. 23, 1973, Ser. No. 390,785**
**Int. Cl. F23j** *15/00*
**U.S. Cl. 431—5** **16 Claims**



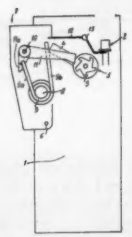
There is disclosed a closed combustion system designed to reduce the level of noise generated by its operation. The system includes an enclosed combustion chamber with ducts for supplying combustion air to the chamber and for supplying atomizing air to the fuel burner. The system is designed to be connected to an industrial furnace or kiln or rotary drier in a substantially sealed manner. A noise attenuator is connected to the combustion chamber air inlet. The combination of the attenuator and the closed construction of the system provides a reduction of the operational noise down to a tolerable level over a wide frequency band.

The combustion system includes apparatus for burning gaseous pollutants. A heater is provided between the gaseous pollutant source and the attenuator to preclude condensation of pollutants in the attenuator. The pollutants pass from the pollutant source, through the heater and attenuator into the combustion chamber where they are burned. Attenuator bypass means also are provided to permit combustion of the pollutants in the heater and direct exhaust to the atmosphere.

## 3,819,320
## IMPROVED AUTOMATIC CIGARETTE LIGHTER

**Pierre Chevallier, Sainte Foy Les Lyon, France, assignor to Etablissements Genoud & Cie, Societe Anonyme, Vessieux, France**

**Filed Dec. 21, 1972, Ser. No. 317,256**
**Int. Cl. F23q** *2/10*
**U.S. Cl. 431—254** **3 Claims**

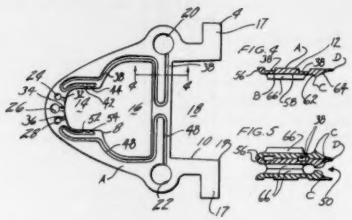


In this automatic lighter a lateral control key or pushbutton is hollow and encloses a spiral spring controlling with one branch one arm of a two-armed pawl driving the ratchet associated with the flint wheel and with the other branch the pressure exerted on the flint, this two-armed pawl being pivoted to the control key. Additionally, in the case of a cigarette lighter operating on gaseous fuel, the lever adapted to lift the burner-and-valve assembly is actuated by one portion of the control key. Thus, the spiral spring has the triple function of returning the control key, urging the flint against the wheel and returning the pawl.

## 3,819,321
## COOLED COMBUSTOR-NOZZLE ASSEMBLY

**Donald L. Witt, North Palm Beach, Fla., assignor to United Aircraft Corporation, East Hartford, Conn.**

**Filed Jan. 3, 1972, Ser. No. 215,968**
**Int. Cl. F23d** *13/24*
**U.S. Cl. 431—350** **7 Claims**

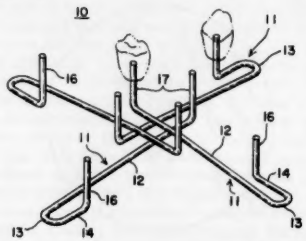


A combination combustor-nozzle is formed of stacked wafers, or plates. Each wafer has two cut-out sections separated by a web. One cut-out section forms a portion of the combustion chamber and mixing chamber while the other cut-out section forms a portion of the diffuser. The webs form nozzles between the wafers. Openings in the wafers adjacent the portion of the cut-out section forming the combustion chamber have grooves extending to the inner edge of the plate forming an injector. A manifold directs a fuel and oxidant to these openings. Other openings in the wafers have a groove connected thereto which extends along the webs to the edge of the wafer adjacent the downstream end of the cut-out forming the combustion chamber. A coolant or diluent supply directs its fluid to these grooves.

## 3,819,322
## ARTICLE SUPPORT IN OVEN

**Harvey Bocian, Jericho, and Allan L. Brent, Dobbs Ferry, both of N.Y., assignors to Labco Products, Inc., Jamaica, N.Y.**

**Filed Jan. 11, 1973, Ser. No. 322,768**
**Int. Cl. F27b** *21/04*
**U.S. Cl. 432—5** **11 Claims**



A bracket for supporting an article such as an unfinished artificial bridge, cap or denture having one or more sockets in the heat treatment and other processing steps is formed of a work hardenable metal which is stress relieved, nonflaking, non-distorting and forms an adherent thin protective oxide

coating at the heat treatment temperature. The bracket includes a base and a plurality of upwardly directed support legs which are deformable to mate and releasably engage corresponding bridge sockets. The bracket is formed of weld connected intersecting slightly outwardly downwardly inclined horizontal rods terminating in the support legs or includes a base member having channel sections which slidably engage one or more plug members each of which is provided with a pair of support legs, or band which supports the support legs.

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**3,819,323**

## MINIMUM SCALE REHEATING FURNACE AND MEANS RELATING THERETO

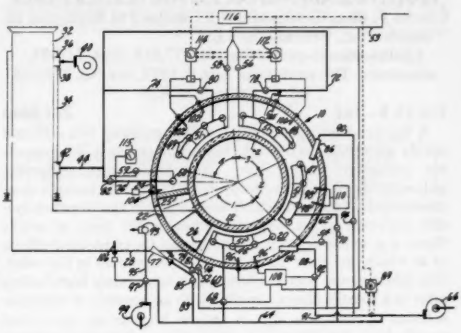
**Klaus H. Hemsath, Sylvania, Ohio; Frank J. Vereecke, Palmyra, Mich., and Norman T. Ferguson, Maumee, Ohio, assignors to Midland-Ross Corporation, Cleveland, Ohio**

**Filed Mar. 17, 1972, Ser. No. 235,610**

**Int. Cl. F27b** *9/28, 9/16*

**U.S. Cl. 432—138** **7 Claims**

A ferrous work reheating furnace wherein high fuel efficiency is achieved with minimum scale formation. The work is initially heated in an atmosphere which is slightly oxidizing, the work being in a temperature range where scale formation does not readily occur. The work is then placed in a slightly reducing atmosphere after it reaches a predetermined elevated temperature. A unique arrangement is provided wherein a continuous reheating process takes place utilizing a protective atmosphere generated by hot air burners during the high temperature phase. These burners have a low air to fuel ratio and the gases are caused to flow toward the location where the work is introduced. The combustibles within the gases are



combusted through the introduction of air into the portion of the furnace nearest the charge end. Additional efficiency is gained by using the spent gases to preheat combustion air for the burners.

# CHEMICAL

## 3,819,324

### FUGITIVE-STAINING PROCESS FOR TEXTILE FIBERS

**Charles F. Bino, Greensboro, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.**

**Continuation-in-part of Ser. No. 177,858, Sept. 3, 1971, abandoned. This application Aug. 9, 1972, Ser. No. 279,058**

**Int. Cl. D06p** *3/00, 3/54*

**U.S. Cl. 8—164** **28 Claims**

A fugitive-staining process for distinguishing two different textile materials, particularly but not necessarily, basic-dyeable polyester fibers from unmodified disperse-dyeable polyester fibers. In one of its preferred forms the process comprises testing fabrics in which basic-dyeable and disperse-dyeable polyester yarns, with or without other types of textile fibers, e.g. nylon or wool, are patterned for cross-dyed effects or in which one yarn is a suspected contaminant in the other. The fabric is wet with a solution of a moderately high-boiling ester in a volatile diluent, treated with an aqueous or alcoholic solution of an acidic dye or optical brightening agent, and usually heated to develop a color contrast. The basic-dyeable yarn develops a deeper stain which is easily removed by scouring.

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## 3,819,325

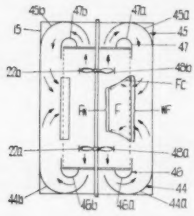
### METHOD OF TREATING A FABRIC WEB WITH A LIQUID

**Emile Bernard Bates, 11 Barrington Rd., Leicester, England**

**Continuation of Ser. No. 155,859, June 23, 1971, abandoned. This application June 14, 1973, Ser. No. 369,992**

**Int. Cl. B05c** *3/132*

**U.S. Cl. 8—151** **3 Claims**




A method of and apparatus for treating a fabric web with a liquid, in which the fabric web is passed through a bath of the liquid and around and in contact with the perforated periphery of a rotating drum at least partially immersed in the liquid. The drum contains two axially-spaced impellers which circulate the liquid to flow substantially radially through the fabric web and perforated drum periphery and substantially axially within the drum interior and through the ends of the drum. The liquid flow is preferably inwards through the fabric web and drum perforations, and outwards through the ends of the drum. The axial positioning of, or spacing between, the impellers is adjustable, thereby to confine the flow through the fabric web and drum perforations to an adjustably selected region in the length of the drum which substantially coincides with the width of the fabric web.

## 3,819,326

### PHOSPHONIUM SALT ASSISTED DYEING WITH ANIONIC DYES ON POLYAMIDE-POLYESTER FIBERS

**Shiro Shimauchi; Norihiro Minemura; Takeshi Matsui; Kenji Ito, all of Osaka; Takeo Shima, Iwakuni; Shoji Kawase, Iwakuni, and Masataka Oshima, Iwakuni, all of Japan, assignors to Teijin Limited, Osaka, Japan**

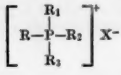
**Division of Ser. No. 804,294, March 4, 1970, Pat. No. 3,666,403. This application Apr. 18, 1972, Ser. No. 245,257**

**Claims priority, application Japan, Mar. 14, 1968, 43-16906; Apr. 5, 1968, 43-22501; June 3, 1968, 43-56828; July 19, 1968, 43-51277; July 30, 1968, 43-54071; Aug. 22, 1968, 43-60034; Aug. 23, 1968, 43-61638; Aug. 28, 1968, 43-61638; Sept. 26, 1968, 43-69736**

**Int. Cl. D06p** *5/04*

**U.S. Cl. 8—171** **1 Claim**

A method of dyeing a textile fiber selected from the group consisting of the modified polyester, polyvinyl chloride, polyacrylonitrile and cellulose acetate fibers, such method comprising dyeing the fibers with an anionic dyestuff in the presence of at least one quaternary phosphonium salt of the formula



wherein R, $R_1$, $R_2$ and $R_3$ are each selected from the group consisting of alkyl, alkenyl, cycloalkyl, aryl and aralkyl groups of one to 18 carbon atoms and X is selected from the group consisting of halogens, alkoxy sulfate and OH group.

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## 3,819,327

### METHOD OF PRINTING SYNTHETIC FIBERS

**Hiroji Kuwayama, Shiga; Hiroyuki Kajita, Osaka; Tadashi Asayama, and Nobuyuki Nishio, both of Kyoto, all of Japan, assignors to Meisei Chemical Works, Ltd., Ukyo-ku, Kyoto, Japan**

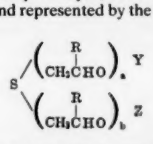
**Filed June 28, 1972, Ser. No. 267,098**

**Claims priority, application Japan, June 30, 1971, 46-47792**

**Int. Cl. D06p** *1/86*

**U.S. Cl. 8—172** **5 Claims**

The method of printing synthetic fibers and chemical fibers such as polyamide, and polyester, polyacrylonitrile and acetate fibers with disperse dyes, cationic dyes and acid dyes employs a compound represented by the general formula



wherein R is -H or $-CH_3$; *a* is an integer from 1 to 6 and *b* is an integer from 0 to 3, provided *a*+*b* is six or less; and Y and Z are -H or $-CH_2CH_2CN$, provided Y and Z are not -H at the same time.

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## 3,819,328

### USE OF ALKYLENE POLYAMINES IN DISTILLATION COLUMNS TO CONTROL CORROSION

**Ting Sin Go, Crestwood, Mo., assignor to Petrolite Corporation, Wilmington, Del.**

**Continuation-in-part of Ser. No. 48,975, June 24, 1970, abandoned. This application June 19, 1973, Ser. No. 371,393**

**Int. Cl. C23f** *14/02*

**U.S. Cl. 21—2.5 R** **12 Claims**

Alkylene polyamines, such as ethylene diamine (EDA), are employed to control acid corrosion in distillation columns,

such as occurs in petroleum distillation columns; preferably where the polyamine is employed in conjunction with a corrosion inhibitor, for example, a non-neutralizing corrosion inhibitor such as a film-forming corrosion inhibitor.

pH control is more accurately and easily achieved with polyamines, such as EDA, than with either ammonia or morpholine. By employing EDA one preferably regulates the pH between about 5.5 – 7 and preferably about 6 – 7 with minimal deviations therefrom, thus avoiding or minimizing corrosion on the acid side (< about pH 5.5) and fouling on the basic side (> about pH 7).

In addition, the addition of amines to the petroleum charge prior to distillation in place of caustic treatment reduces the amount of HCl in the distillation column without the disadvantages resulting from the conventional caustic treatment.

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**3,819,329**

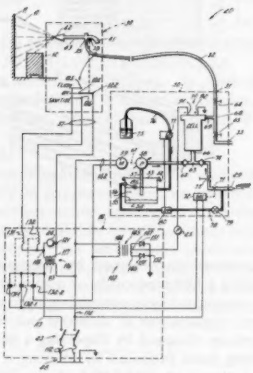
## SPRAY SANITIZING SYSTEM WITH ELECTROLYTIC GENERATOR

**Erwin A. Kaestner, and John Spink, both of Cincinnati, Ohio, assignors to Morton-Norwich Products, Inc., Chicago, Ill.**

**Continuation-in-part of Ser. No. 142,207, May 11, 1971, abandoned. This application Dec. 6, 1972, Ser. No. 312,630**

**Int. Cl. A23b** *1/00;* **A61l** *13/00;* **B01k** *1/00*

**U.S. Cl. 21—58** **3 Claims**



A spray sanitizing system for creating a continuous supply of sanitizing liquid is provided with a hand operable wand having a liquid discharge nozzle and a portable central generator unit which includes an electrolytic cell for instantaneously generating a relatively low pH bactericidal solution containing nascent chlorine substantially entirely in the form of hypochlorous acid.

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**3,819,330**

## FLUID MONITORING SYSTEM AND FLUID SAMPLING METHOD AND APPARATUS FOR USE THEREWITH

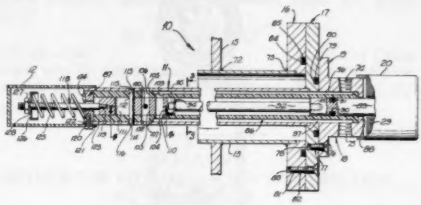
**David M. Creighton, Hacienda Heights, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.**

**Filed Feb. 7, 1972, Ser. No. 224,026**

**Int. Cl. G01n** *1/22, 27/44*

**U.S. Cl. 23—254 E** **13 Claims**

A method and system which may be employed for monitoring hydrogen sulfide and sulfur dioxide in flue gases including a probe having an air supply to pick up a sample. Delivery and dilution is performed automatically and immediately after a sample is taken. Prior art conduit clogging is avoided by the immediation dilution. The diluted sample is conveniently titrated although an air-sample mixer is connected between the probe and the titrator. Continual sampling is performed by the use of a pulse oscillator which repeatedly energizes a probe solenoid. Repeated pressure indications occur when the probe pick up is in a sample pick up position. The probe pick up cavity is repeatedly purged immediately after each sample



is taken to keep the cavity clean. The probe includes an inner hollow teflon cylinder which is in pressure contact with an outer concentric stainless steel cylinder. The teflon has axial grooves to provide fluid tight passageways or conduits. The teflon is kept in axial compression to keep the grooves fluid tight.

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**3,819,331**

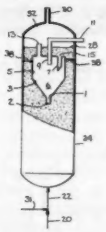
## PHASE SEPARATION APPARATUS

**Carl L. Weber, Washington Crossing, Pa., assignor to Hydrocarbon Research, Inc., New York, N.Y.**

**Continuation-in-part of Ser. No. 137,232, April 26, 1971, abandoned. This application Aug. 9, 1973, Ser. No. 386,961**

**Int. Cl. B01j** *9/08, 9/20*

**U.S. Cl. 23—284** **9 Claims**



In an ebullated bed reactor the further separation of the liquid, gas and solids is achieved by use of a disengaging device in the upper portion of the reactor without disturbing the operation of the ebullated bed. The device is essentially cylindrical with a conical bottom. The liquid-gas-solid mixture enters the reactor through the top of the device while the concentrated solids slurry leaves through the bottom and the gas and solids-free liquid leave through the top.

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**3,819,332**

## APPARATUS FOR PRODUCING SOLID POLYMERS BY LIQUID TRANSFORMATION

**Roland Jaccard; Paul Hostettler, both of Basel, and Rudolf Siegrist, Hofstetten/So, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland**

**Filed June 22, 1971, Ser. No. 155,481**

**Claims priority, application Switzerland, June 26, 1970, 9707/70**

**Int. Cl. B01j** *2/12, 2/24*

**U.S. Cl. 23—260** **7 Claims**

Apparatus for performing reactions involving the formation of a solid phase from a liquid phase comprises a rotatable

drum into which the liquid phase is introduced, as by spraying and scraper means arranged above the liquid introducing means for detaching solid phase from the upper part of the drum so that it can fall into intercepting means for conveying

the solid phase out through an opening in one end wall of the drum. The drum conveniently forms the upper part of a tower reactor that can be heated or cooled and in which an after-treatment can be performed on the solid phase.

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**3,819,333**

**APPARATUS FOR THE SEPARATION OF ORGANIC ACID ANHYDRIDES**

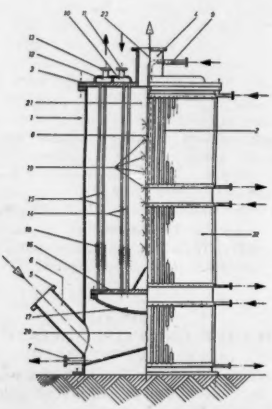
**Erich Brand, Cologne, Braunsfeld, and Hans-Dieter Barth, Geyen, both of Germany, assignors to Chemiebau Dr. A. Zieren GmbH & Co. KG, Cologne-Mungersdorf, Germany**

**Continuation-in-part of Ser. No. 164,799, July 26, 1971. This application Aug. 3, 1971, Ser. No. 168,719**

**Claims priority, application Germany, July 25, 1970, 2036946**

**Int. Cl. B01d** *7/00, 9/00*

**U.S. Cl. 23—273 F** **9 Claims**



For the desublimation of phthalic anhydride and the like, the desublimator apparatus comprises a vertical cylindrical housing and an annular finned tube bundle depending from the top of the housing which defines a central chamber within the tube bundle, a channel for incoming gas between the cylindrical wall land the tube bundle, and a gas inlet space between the bottom of the tube bundle and the bottom of the housing. A distributor pipe for spraying the tubes with liquid phthalic anhydride is disposed in the central chamber, and the fins of the tubes extend downwardly in alternating directions to improve heat transfer and to assist removal of the molten product from the fins. The incoming gas is uniformly distributed with little or no short circuiting as it passes from the exterior channel through the tube bundle into the central chamber.

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**3,819,334**

**CATALYTIC REACTION APPARATUS FOR PURIFYING WASTE GASES CONTAINING CARBON MONOXIDE**

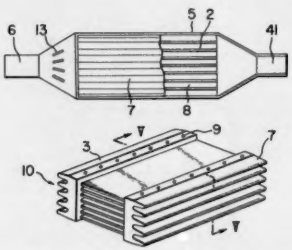
**Yoshinaga Yoshida; Toshiyuki Kii; Shigehiko Kobayashi; Kazuhide Miyazaki; Michiaki Yamamoto, and Yasuo Seki, all of Tokyo, Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan**

**Filed Oct. 6, 1971, Ser. No. 187,093**

**Claims priority, application Japan, Dec. 29, 1970, 45-130255; Oct. 27, 1970, 45-94521; Dec. 17, 1970, 45-113412**

**Int. Cl. F01n** *3/14;* **B01j** *9/04*

**U.S. Cl. 23—288 F** **7 Claims**




A catalyst composition obtained by dispersing a power catalyst containing a hydrated oxide or oxides or manganese dioxide in an organic solution containing alkoxytitanate, alkoxy substituted organosilane or dimethyl polysiloxane or a catalyst composition obtained by dispersing a power catalyst in a heat-resisting paint prepared by utilizing a liquid compound having a siloxane bond as the vehicle. The catalyst is exposed moderately when it is adhered to a carrier when said catalyst composition is prepared by employing a catalyst whose principal components consist of manganese oxide or oxides and lead oxide or oxides and/or bismuth oxide or oxides, it is best suited for oxidation and purification of a waste gas containing carbon monoxide. Besides, catalyst reaction apparatuses prepared by making the foregoing catalyst composition adhere to a carrier consisting of plural metallic plates and connecting one end or both ends of said carrier with a metallic structure configured to be suitable for the purpose of cooling is effective in gas-solid heterogeneous catalytic reaction.

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**3,819,335**

**PREPARATION OF MACROCRYSTALLINE, HEXAGONAL ALUMINUM HYDRIDE**

**Roger D. Daniels, and John A. Snover, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.**

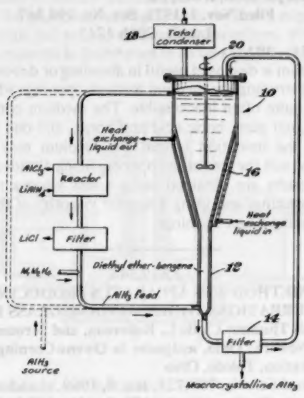
**Filed Nov. 15, 1967, Ser. No. 684,099**

**Int. Cl. B01j** *17/00;* **C01b** *6/00*

**U.S. Cl. 23—300** **8 Claims**

An improved process for preparing macrocrystalline, substantially non-ether solvated aluminum hydride wherein an

aluminum hydride feed material is carried in a liquid of about the same composition as the crystallizing liquid thereby




eliminating the need for removal of excess ether solvent from the crystallizing system as practiced heretofore.

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3,819,336

## METHOD OF MAKING ULTRA-FINE AMMONIUM PERCHLORATE PARTICLES

**Rudy E. Rogers, and James L. Murphy, Jr., both of Huntsville, Ala., assignors to Thiokol Chemical Corporation, Bristol, Pa.**

**Filed Dec. 20, 1972, Ser. No. 316,677**

**Int. Cl. C01d** *1/30*

**U.S. Cl. 23—302** **6 Claims**

A method of making ultra-fine ammonium perchlorate particles by spraying an aqueous ammonium perchlorate solution containing a surface active agent onto a moving film of a refrigerated organic liquid to form fine frozen droplets in said film and recovering fine ammonium perchlorate particles from the frozen droplets by freeze drying. The product particles have weight mean diameters of less than 1 micron and are especially useful in the manufacture of solid rocket propellants.

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3,819,337

## SEPARATION OF MACROCRYSTALLINE NON-SOLVATED ALUMINUM HYDRIDE

**Buddy L. York, Akron, and Kazuji Terada, Midland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.**

**Filed Mar. 23, 1964, Ser. No. 354,820**

**Int. Cl. C01j** *9/06*; **C01l** *6/00*

**U.S. Cl. 423—130** **4 Claims**

1. A process for separating macrocrystalline, non-solvated aluminum hydride from finely divided aluminum hydride contaminant material which comprises;

a. providing a mixture of a macrocrystalline non-solvated aluminum hydride having finely divided, aluminum hydride contaminant material associated therewith,

b. treating said mixture with liquid aluminum chloride mono-diethyl etherate at a temperature of from about 40° C. to about 90° C. for a period of from about 5 to about 30 minutes, the gram mole proportions of said aluminum chloride mono-diethyl etherate and said aluminum hydride contaminant material at a minimum being about 3/1, and

c. separating the resulting aluminum hydride contaminant enriched liquid phase from the residual non-solvated macrocrystalline aluminum hydride which is depleted in said aluminum hydride contaminant material.

3,819,338

## PROTECTIVE DIFFUSION LAYER ON NICKEL AND/OR COBALT-BASED ALLOYS

**Karl Bungardt; Gunter Lehnert, and Helmut W. Meinhardt, all of Krefeld, Germany, assignors to Deutsche Edelstahlwerke Aktiengesellschaft, Krefeld, Germany**

**Division of Ser. No. 856,539, Sept. 10, 1969, Pat. No. 3,677,789. This application Sept. 17, 1971, Ser. No. 181,600**

**Claims priority, application Germany, Sept. 14, 1968, 1796175**

**Int. Cl. B32b** *15/00*

**U.S. Cl. 29—194** **1 Claim**

Nickel and/or cobalt-based alloys are given a protective coating by diffusing into the surface of the alloy metallic aluminum and one or more metals of the platinum groups.

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3,819,339

## METHOD FOR ROTARY BI-AXLE TYPE FRICTION WELDING

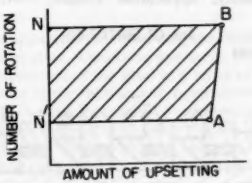
**Nobuo Takagi, Kariya; Takeshi Kubo, Oobu, and Takashi Takiguchi, Kariya, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi-ken, Japan**

**Filed Dec. 28, 1971, Ser. No. 212,910**

**Claims priority, application Japan, Dec. 30, 1970, 45-123068**

**Int. Cl. B23k** *27/00*

**U.S. Cl. 29—470.3** **6 Claims**




This disclosure relates to a method and apparatus for friction welding wherein an improved friction welding of a first and a second workpieces are carried out in a manner such that welded and plasticized workpieces are rapidly synchronized and also a larger thrust is provided at only the end stage of the welding so that change of metallic structure of welded workpieces due to cooling which tends to cause cracks in the welded portion is prevented. In order to carry out this improved friction welding, the apparatus for friction welding includes a second driving means for driving the second workpiece, detecting means for detecting the sum of the lengths of welded workpieces capable of providing a signal for interrupting the drive of the first workpiece and hydraulic systems capable of adjusting the thrust according to a signal from the detecting means.

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3,819,340

## METHOD OF MANUFACTURING DRY ALUMINUM CAPACITORS, AND CAPACITORS OBTAINED BY THIS METHOD

**Jan Heier, Emmasingel, Eindhoven, and Waltherus Andreas Zoethout, Zwolle, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Mar. 14, 1973, Ser. No. 340,965**

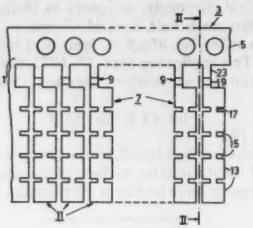
**Claims priority, application Netherlands, Mar. 20, 1972, 7203719**

**Int. Cl. B01j** *17/00*

**U.S. Cl. 29—570** **3 Claims**

A method of manufacturing dry aluminium capacitors wherein anode elements are punched from an aluminium plate and are successively etched, formed and provided with a semiconductor layer. After the covering with a graphite layer

and a silver layer, an anode wire is connected to the anode element and a cathode wire is connected to the silver layer. Each anode element consists of a strip of coherent plates which,



after etching and prior to forming, are folded one on the other so as to form a stack. Each strip is connected to a carrier ribbon by a connection tag on which a dam is formed which projects from the plane of the carrier ribbon.

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**3,819,341**

**METHOD OF MANUFACTURING INTEGRATED MAGNETIC MEMORIES**

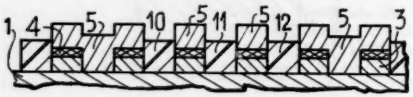
**Robert Ponnet, Antony, France, assignor to Thomson-CSF, Paris, France**

**Filed Nov. 17, 1972, Ser. No. 307,526**

**Claims priority, application France, Nov. 23, 1971, 71.41841**

**Int. Cl. H01f 7/06**

**U.S. Cl. 29—604** **3 Claims**



A method for manufacturing integrated magnetic memories, including a ferromagnetic plate with an aperture through which extend the associated conductors, comprises essentially the steps of depositing upon a metal substrate of a succession of first layer of copper and a second layer of ferromagnetic material according to an appropriate pattern; the substrate zone where the conductors are to be extended through said plate being protected by resin; exposition of said resin, laying bare said substrate zones; depositing a third layer of said copper; detaching the copper-ferromagnetic material plate thus realized from said substrate; depositing conductors; removing said copper and filling all the interstices thus created with an insulating material.

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**3,819,342**

**TRANSPARENT CANDLE**

**Anthony J. Gunderman, Monroe, N.Y., and Richard D. Forshay, Wyckoff, N.J., assignors to Avon Products, Inc., Suffern, N.Y.**

**Continuation of Ser. No. 128,501, March 26, 1971, abandoned. This application Oct. 16, 1972, Ser. No. 297,614**

**Int. Cl. C10l 5/00**

**U.S. Cl. 44—7.5** **10 Claims**

A transparent candle composition comprising a thermoplastic polyamide resin and a flammable solvent therefor capable of solubilizing said resin at a temperature below about 212°F. and of forming with said resin a transparent gel-type structure, said solvent being selected from the group consisting of unsaturated fatty acids, unsaturated fatty alcohols, saturated fatty alcohols, esters of fatty acids with polyhydric alcohols and glycerol, and mixtures thereof, and being present in an amount sufficient to gel the resin.

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**3,819,343**

**MEDIUM FOR PROCESS OF HONING BY EXTRUDING**

**Lawrence J. Rhoades, Pittsburgh, Pa., assignor to Extrude Hone Corporation, Irwin, Pa.**

**Filed Nov. 1, 1971, Ser. No. 194,567**

**Int. Cl. C08h 17/12**

**U.S. Cl. 51—302** **7 Claims**

A medium is disclosed useful in abrading or deburring metal parts by extruding the medium through openings which otherwise are quite often inaccessible. The medium comprises essentially guar gum, boric acid and borax, and one of the features of the invention is that the medium may be easily tailored to suit the size of the opening being abraded since optimum results are obtained using a less viscous medium in smaller openings and using a heavier viscosity of the medium when treating larger openings.

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**3,819,344**

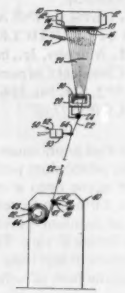
**METHOD AND APPARATUS PRODUCING PERTURBATIONS WHILE WINDING GLASS FIBERS**

**J. Randall Thumm; Cletis L. Roberson, and Jerome P. Klink, all of Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio**

**Division of Ser. No. 789,725, Jan. 8, 1969, abandoned. This application Aug. 4, 1972, Ser. No. 277,962**

**Int. Cl. C03b 37/02**

**U.S. Cl. 65—2** **10 Claims**



A multifilament textile product having predetermined dimensional perturbations along the length of the filaments sufficient to conceal otherwise visible contrasts in fabric produced from a textile product without the perturbations and method and apparatus for producing the product.

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**3,819,345**

**PRODUCTION OF FIBERS FROM THERMOPLASTIC MATERIALS, PARTICULARLY GLASS FIBERS**

**Jean Battigelli, Rantigny, France, assignor to Saint-Gobain, Neuilly-sur-Seine, France**

**Filed Mar. 29, 1972, Ser. No. 239,250**

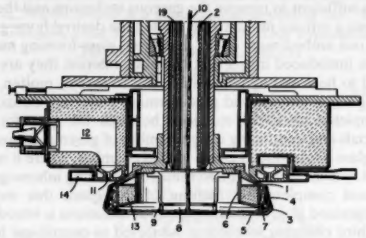
**Claims priority, application France, Apr. 7, 1971, 71.12223**

**Int. Cl. C03b 37/04**

**U.S. Cl. 65—6** **27 Claims**

The production of fibers from thermoplastic materials, particularly glass fibers, by feeding a molten stream of the material into the interior of a hollow centrifuge body of enlarged diameter rotating rapidly around a vertical axis, which body is provided with a peripheral wall of substantial height which is pierced with a large number of rows of orifices through which the molten material is projected by centrifugal force in the form of filaments, which are then attenuated into fibrous form by hot gaseous blasts acting in a direction transverse to the planes of emission of the filaments. The deformation of the

centrifuge body is reduced and its operating life is extended by critically controlling the temperature of the molten material which is projected through the orifices by first directing the incoming stream of molten material onto an annular supporting element or flange which is integral with the lower edge of said peripheral wall and extending inwardly therefrom, wherefrom the molten material is distributed in an upward direction along



the interior face of said peripheral wall in position to be projected through the orifices therein. The introduction of the molten material upwardly from the annular flange or support element enables the accurate control of the temperature of the molten material by heating the latter or the support element so that the temperature of the peripheral wall is substantially constant along the entire height thereof, resulting in the production of fibers of uniform characteristics.

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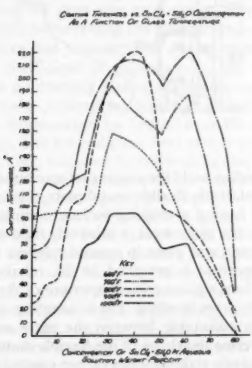
**3,819,346**

## METHOD FOR APPLYING AN INORGANIC TIN COATING TO A GLASS SURFACE

**Russell D. Southwick, Butler, and Everett C. Smith, Slippery Rock, both of Pa., assignors to Glass Container Manufacturers Institute, Inc., New York, N.Y.**

**Filed May 8, 1972, Ser. No. 251,159**
**Int. Cl. C03b** *17/20*
**U.S. Cl. 65—24** **6 Claims**



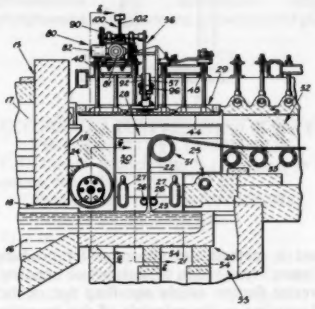
An inorganic tin coating is applied to a glass surface by exposing the surface at elevated temperature, desirably at least 700°F., to a liquid comprising a tin chloride hydrate, for example an aqueous solution of stannic chloride pentahydrate. The process is especially useful for providing the "hot end coating" of a dual protective coating for glass containers comprising an inorganic "hot end coating" and a lubricious organic "cold end coating."

**3,819,347**

## TEMPERATURE REGULATION OF MOLTEN GLASS

**Gerald A. Callies, Toledo, Ohio; Frank W. Irland, Ottawa, Ill.; Russell C. Retzloff, Maumee, Ohio, and James T. Zellers, Charleston, W. Va., assignors to Libbey-Owens-Ford Company, Toledo, Ohio**

**Filed July 31, 1972, Ser. No. 276,654**
**Int. Cl. C03b** *15/04*
**U.S. Cl. 65—29** **17 Claims**



Method and apparatus for controlling the thickness of vertically drawn sheet glass. A scanning pyrometer periodically observes the temperature of the glass in a series of zones across the drawing area at the meniscus through which the sheet is drawn. A muffle having a plurality of corresponding temperature control zones extends transversely above the stream of molten glass flowing into the drawing area. The temperature of the glass flowing beneath each zone of the muffle is individually regulated in response to the observed temperature in a corresponding zone at the meniscus to thereby deliver to the drawing area glass at a predetermined temperature which will produce a sheet of the desired uniform thickness.

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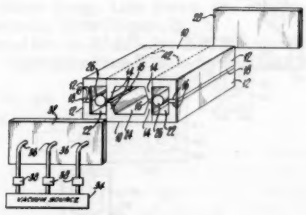
**3,819,348**

## SIMPLIFIED METHOD FOR BONDING FERRITE CORES

**Joseph John Murray, Nesconset, N.Y., assignor to Potter Instrument Company, Inc., Plainview, N.Y.**

**Filed July 26, 1971, Ser. No. 166,125**
**Int. Cl. C03b** *23/20*
**U.S. Cl. 65—36** **2 Claims**

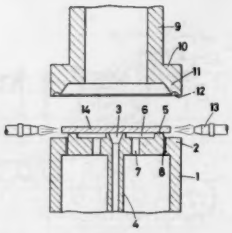


In a method for manufacturing glass-bonded ferrite-core magnetic transducers, cavities formed between a pair of ferrite blocks are evacuated in order to clamp the blocks together and to insure that the glass flows adequately into gaps to be bonded.

## 3,819,349
## METHOD AND APPARATUS FOR PRODUCING WATCH CRYSTALS

Hiroshi Shimizu, Kasugai; Shunsaku Sakakibara, and Ryoichi Ishigure, both of Nagoya, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Dec. 15, 1972, Ser. No. 315,680
Int. Cl. C03b 23/02
U.S. Cl. 65—63 5 Claims

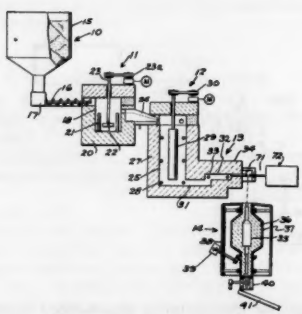



Disclosed is method and apparatus for producing semi-finished "mesa" type watch crystals whose opposite surfaces have a precise flatness nearly equalling that of the finished crystal. According to the principle of this invention a glass sheet is, after being finely ground, heated and softened around the annular perimeter part of the glass sheet, which part is to be shaped into the bent flange portion of the mesa type crystal. In the course of heating the invasion by flames over the opposite surfaces of the glass sheet beyond the annular perimeter part thereof is completely prevented, thus assuring that the fine-ground surfaces of the glass sheet are not spoiled by flames, retaining a precise flatness nearly equalling that of the finished crystal.

## 3,819,350
## METHOD FOR RAPIDLY MELTING AND REFINING GLASS

Fred G. Pellett, Maumee; Raymond S. Richards, Toledo; Robert R. Rough, Toledo; Douglas F. St. John, Toledo, and Paul R. Wengert, Toledo, all of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Sept. 28, 1972, Ser. No. 292,991
Int. Cl. C03b 5/00, 5/16
U.S. Cl. 65—134 9 Claims

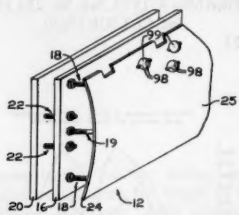


In accordance with the method of this invention, glass-forming materials are subjected to heat and agitation sufficient to form a molten glass having some undissolved glass-forming materials, cords, and incompleted chemical reactions between the glass-forming materials and containing a high number of gaseous inclusions. This molten glass is subjected to a shearing action to complete the melting of any unmelted sand grains remaining from the glass-forming materials, and to complete the chemical reactions that may have been incomplete, and to remove any cords remaining but leave the glass with gaseous inclusions; this glass is thereafter subjected to centrifugal forces sufficient to remove the gaseous inclusions and thereby produce a refined molten glass having the desired homogeneity. In one embodiment of the invention, glass-forming materials are introduced into a first chamber wherein they are subjected to heat and agitation sufficient to form a molten glass having some undissolved glass-forming materials, cords, and incompleted chemical reactions between the glass-forming materials and containing a high number of gaseous inclusions. This glass is introduced into a second chamber, where it is subjected to a shearing action to remove remaining inhomogeneities and complete the melting of the glass; this molten, homogenized glass containing gaseous inclusions is introduced to a third chamber where it is subjected to centrifugal forces sufficient to remove the gaseous inclusions, producing a refined, homogeneous molten glass, which is discharged from the third chamber.

## 3,819,351
## APPARATUS FOR PRESS BENDING AN APERTURED GLASS SHEET

Paul D. Shaffer, Tyrone, and David C. Plank, Altoona, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 6, 1973, Ser. No. 330,146
Int. Cl. C03b 23/02
U.S. Cl. 65—273 10 Claims




In a press bending mold for shaping an apertured glass sheet comprising a relatively flexible metal plate (also known as a shaping plate) having a shaping surface complementary to that desired for the glass sheet, a relatively rigid member and means connecting said plate in spaced relation to the rigid member, an aperture is provided in the relatively flexible metal plate to face a given critical aperture of the glass sheet to be shaped by press bending. The connecting means which are individually adjustable between the plate and the rigid member for altering the shape of the flexible metal plate relative to the relatively rigid member do not control the perimeter surrounding the critical apertures of sheets as well as desired. Therefore, the present invention provides a special plug for each aperture in the shaping plate. An adjustment member is secured to each plug for individual adjustment relative to the relatively rigid member so that the position of each plug is adjustable relative to the critical portions of the shaping surface facing the critical apertures of the apertured glass sheet undergoing shaping by press bending. One or both press bending molds of press bending apparatus may be apertured and adjustable plugs provided for each aperture. Means is pro-

vided for maintaining each plug in proper orientation. If the press bending apparatus comprises a convex and a concave mold, the apertures in the concave mold are preferably slightly larger than the apertures in the convex mold.

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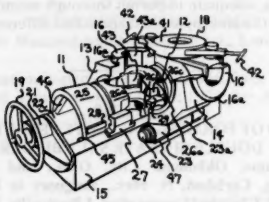
## 3,819,352
## APPARATUS FOR FORMING GLASS-CERAMIC ARTICLES

**Yu K. Pei, 3849 S. Beverly Hills Dr., Toledo, Ohio 43614**

**Division of Ser. No. 267,006, June 28, 1972, Pat. No. 3,809,599, which is a continuation-in-part of Ser. No. 149,650, June 3, 1971, abandoned. This application July 27, 1973, Ser. No. 383,121**
**Int. Cl. C03b 9/00**
**U.S. Cl. 65—357** **9 Claims**



A method and apparatus for making a one-piece, cored glass article of substantial mass and having a complex configuration, by forming a glass-ceramic making material in molten state in a four-part mold having opposed members in pairs juxtapositioned and cooperating collectively to form a cored molding cavity. The closed and clamped mold includes an upper loading opening into which a pressing plunger is manipulated for pressing the material. The said material is of about 3 poise viscosity or less as it is loaded into the mold. The molten glass is pressed in the cored mold to fill the complex cavity and define the configuration of the article. Thereafter, during cooling the glass, the pressure on the glass is reduced by sequentially withdrawing the plunger and one or more of the mold faces and core sections to compensate for the difference in coefficient of expansion in the heat exchange between the contracting glass (undergoing cooling) and the expanding mold (undergoing heating). The faces of the opposed mold members are backed off from the hardening glass progressively. The formed glass liner article is cooled so as to prevent cracking, removed from the mold and inspected. Surplus inner and exterior segments of the article are then finished by drilling, cutting and grinding. The "green glass" article, partially mechanically finished, is then converted to a glass-ceramic material by heat treatment, and then given final finishing. In the apparatus, a massive metal bed supports two pairs of opposed mold faces, comprised of a pair of end mold members and a pair of side mold members. The end mold members are movable longitudinally along the bed toward and away from each other and the side mold members are movable laterally of the bed toward and away from each other. The side mold members are pivotably mounted for juxtaposed positioning on the bed; the end molds are movable longitudinally along a track in the bed bottom for juxtaposed positioning cooperating with the side mold members to define a cored mold cavity for forming a one-piece article of glass. A pair of hand cranks and turn screws, mounted on each end of the bed, propels the end mold members on the bed. A closure member positioned about the top of the end members defines the loading aperture for the mold and locks the closed mold members in molding or forming position during the pressing operation.

## 3,819,353
## PLANT GROWTH REGULANT CARBAMOYLPHOSPHONATES

**William P. Langsdorf, Jr., Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.**

**Continuation-in-part of Ser. No. 731,732, May 24, 1968, Pat. No. 3,627,507, and a continuation-in-part of Ser. No. 803,962, March 3, 1969, abandoned. This application Oct. 29, 1970, Ser. No. 85,221**
**Int. Cl. A01n**
**U.S. Cl. 71—76** **21 Claims**

This disclosure teaches a method for employing novel carbamoylphosphonates such as ammonium ethyl carbamoylphosphonate and ammonium allyl carbamoylphosphonate to regulate the growth rate of plants.

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## 3,819,354
## TOBACCO SUCKER CONTROL WITH DIALKYL 1,2,5-THIADIAZOL-3-YL PHOSPHATES

**Stanley T. D. Gough, Branchburg, N.J., assignor to Mobil Oil Corporation, New York, N.Y.**

**Filed Feb. 26, 1973, Ser. No. 335,993**
**Int. Cl. A01n 9/36**
**U.S. Cl. 71—78** **2 Claims**

The growth of tobacco axillary shoots (suckers) is controlled by contacting them with a growth controlling amount of a di($C_1$-$C_5$) alkyl 1,2,5-thiadiazol-3-yl phosphate.

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## 3,819,355
## HERBICIDAL 2-ARYL-4,4-DIALKYL-5-HALOMETHYLENE-OXAZOLINES

**Patrick J. McNulty, Wyndmoor; Colin Swithenbank, Perkasie; Kenneth L. Viste, Warminster, and William C. Von Meyer, Willow Grove, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.**

**Division of Ser. No. 829,084, May 29, 1969, Pat. No. 3,661,991. This application Apr. 19, 1971, Ser. No. 135,483**
**Int. Cl. A01n 9/00**
**U.S. Cl. 71—88** **4 Claims**

Biocidal compositions which contain as the active ingredient a compound belonging to the class of 2-(mono, di or tri-substituted-phenyl)-4,4-dialkyl-5-halomethylene-oxazolines and their salts and their use in controlling plant growth and phytopathogenic fungi.

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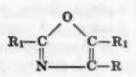
## 3,819,356
## OXAZOLES AND THEIR USE AS HERBICIDES

**Harold Elmer Zaugg, Lake Forest, Ill., assignor to Abbott Laboratories, North Chicago, Ill.**

**Division of Ser. No. 83,661, Jan. 23, 1970, abandoned. This application Mar. 1, 1972, Ser. No. 230,936**
**Int. Cl. A01n 9/22**
**U.S. Cl. 71—88** **1 Claim**

Covers oxazoles of the formula



where R is a halo group and $R_1$ is an aryl group. Also covers their method of employment as herbicides.

3,819,357

## QUATERNARY THENYL AMMONIUM SALTS AS PLANT GROWTH CONTROL AGENTS

Peter F. Epstein, Prairie Village, Kans.; Joseph R. Caffrey, Independence, Mo., and Pyung Kyung Yu, Overland Park, Kans., assignors to Baychem Corporation, New York, N.Y.

Division of Ser. No. 116,258, Feb. 17, 1971, Pat. No. 3,748,343. This application Jan. 9, 1973, Ser. No. 322,267

Int. Cl. A01n 9/12

U.S. Cl. 71—90 10 Claims

Quaternary thenyl ammonium salts, i.e., [(optionally 2, 3, 4 and/or 5 halo, alkyl, cyano, alkoxycarbonyl and/or nitro-substituted)-5 or 4-thenyl]-[tri(same or mixed) alkyl, alkenyl, alkinyl, substituted alkyl, cycloalkyl, heterocyclic and/or aryl]-ammonium salts, i.e., halides, nitrates, azides, thiocyanates, sulfates, phosphates, )-ethyl-xanthates, etc., which possess plant-growth regulating properties, including synergistic properties.

3,819,358

## RETARDING PLANT GROWTH WITH CYCLOHEXENONE OXIMES

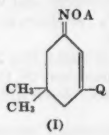
Albert J. Poje, Grandview, Mo., and Peter E. Newallis, Leawood, Kans., assignors to Chemagro Corporation, Kansas City, Mo.

Filed Feb. 23, 1971, Ser. No. 118,180

Int. Cl. A01n 9/20

U.S. Cl. 71—76 3 Claims

Compositions containing, and the use of, 3-substituted 5,5-dimethylcyclohex-2-ene-1-one oximes and their esters of the general formula



(I)

in which

A is hydrogen or $R'\overset{\overset{O}{\|}}{C}-$,

Q is Cl, Br or $R\overset{\overset{(O)_m}{\|}}{S}-$,

R is alkyl or alkenyl having 1–14 carbon atoms, phenyl- or chloro-phenyl-thio-alkyl, phenyl, phenyl which is substituted with 1–5 chlorine atoms and/or alkyl groups having 1–4 carbon atoms,

R′ is hydrogen, alkoxy having 1–5 carbon atoms, arylexy, alkyl having 1–5 carbon atoms, phenyl, chlorophenyl, monoalkylamino having 1–5 carbon atoms, cycloalkylamino having 5 or 6 carbon atoms, phenylamino or phenylamino substituted on the phenyl ring with 1–2 chlorine and/or methyl atoms, and

m is 0 to 2,

in admixture with a solid diluent or carrier or in admixture with a liquid diluent or carrier containing a surface-active agent.

3,819,359

## PINEAPPLE TREATMENT

Donald C. Young, Fullerton, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Aug. 19, 1969, Ser. No. 851,436

Int. Cl. A01n 9/40

U.S. Cl. 71—127 10 Claims

The method for forcing differentiation of the pineapple plant (flowering) or ripening of pineapples by treatment with ethylene as a discontinuous gas phase in an aqueous foam. In a typical embodiment, an aqueous foam comprising water, an oil-in-water surfactant to reduce surface tension and/or a viscous additive to increase the surface viscosity with a discontinuous ethylene-containing gas phase is applied to the pineapple plant. Typically, such a foam composition contains up to 10 volumes of ethylene per volume of liquid and the stability of the foam is sufficient to maintain the ethylene in contact with the pineapple foliage for a period from about 5 to about 300 minutes, adequate to permit thorough assimilation of the ethylene by the pineapple plant and effect differentiation.

3,819,360

## METHOD OF FORMING TACONITE PELLETS WITH A DOUBLE SULFATE SALT BINDER

Albert Adams, Oklahoma City, Okla., and Edward A. Chowning, Carlsbad, N. Mex., assignors to International Mineral & Chemical Corporation, Libertyville, Ill.

Filed Mar. 5, 1973, Ser. No. 338,096

Int. Cl. C21b 1/24

U.S. Cl. 75—3 7 Claims

Taconite fines are pelletized by adding to the taconite 2 to 4 percent by weight of a double salt of potash-magnesia, preferably dissolved in an amount of water equivalent to about 10 to 15 percent by weight of the taconite. The resulting mass is mixed and formed into pellets by granulation or briquetting techniques. The pellets are allowed to cure and then dry to a water content of about 1 to 2 percent.

3,819,361

## METHOD OF SLAG SEPARATION

Magnus Gustav Georg Tiberg, Hallefors, Sweden, assignor to SKF Industrial Trading and Development Company N.V., Amsterdam, Netherlands

Filed Aug. 17, 1972, Ser. No. 281,346

Claims priority, application Sweden, Aug. 24, 1971, 10716/71

Int. Cl. C21c 5/52

U.S. Cl. 75—13 1 Claim

A method of separating slag from molten metal in a tiltable smelting or refining furnace having an inductive transport trough disposed at the discharge opening for the slag operable to effect flow of slag in one direction and repel flow of molten metal in said one direction consisting of the steps of tilting the furnace to a degree where the molten metal is slightly higher than the bottom of the inductive transport trough whereby only slag flows through the transport trough.

3,819,362

## COPPER CONVERTING PROCESS WITH PROLONGED BLOWING PERIOD

Wayne Bushaw; Adam T. Halliday; David R. Mukavitz, and Richard L. Loan, all of White Pine, Mich., assignors to Copper Range Company, New York, N.Y.

Continuation of Ser. No. 822,144, May 6, 1969, abandoned. This application Nov. 2, 1971, Ser. No. 195,001

Int. Cl. C22b 15/00

U.S. Cl. 75—76 4 Claims

In certain copper pyrometallurgical processes, smelting results in a two-layer system comprising an underlying molten

copper-sulfide, iron-sulfide matte, which often undesirably contains nickel, and an overlying siliceous slag, which ordinarily contains a residue of impurities but usually only a minority of the nickel from the charge to the reverberatory furnace. In accordance with the present invention, the step of converting the matte to molten copper by blowing air through the matte is effected under such conditions that (1) the blowing period is sufficiently prolonged to ensure progress beyond the "blister" to the "worm" stage, in which the molten copper and nickel are highly oxidized, so much of the nickel is present as nickel oxide; (2) molten reverb slag, with high carrying capacity for nickel oxide though not necessarily any free silica, is provided over the molten copper in the converter to absorb the nickel oxide; and (3) the nickel oxide containing slag from the converter is returned to the reverb and from there is scrapped.

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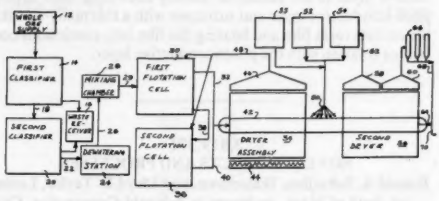
## 3,819,363
## METAL RECOVERY METHOD

**Fritz Walter Wanzenberg, 9 Campbell Ln., Larchmont, N.Y. 10538**

**Continuation-in-part of Ser. No. 49,455, June 24, 1970, abandoned. This application Apr. 7, 1971, Ser. No. 132,061**
**Int. Cl. C22b *11/04***
**U.S. Cl. 75—118** **4 Claims**




A system for recovering noble metal values from chemically composite ore materials. The process is effective to assay as well as to remove commercial quantities of precious metals associated chemically or physically with naturally occurring organic compounds. For example, previous metals which are chelated or are present in the form of complex ions, as well as metals which are physically or chemically bound to or form parts of large organic molecules may be recovered. The starting material may be an ore including water and organic and inorganic underwater deposits, usually from coastal regions. The organic portion of the ore is separated by flotation from the shells, sand, and the like. Calcium carbonate is removed by acid treatment, and the remaining organic float material is treated with a water-immiscible, volatile organic solvent or other material which forms a gel-like material. The solvent, such as benzene or the like, is then reclaimed by heating the mass below the boiling point of water. Thereafter, the precious metal containing composition material is treated with a strong oxidant such as perchloric acid, any excess oxidant is removed from the oxidized compositie material, and the organic precious metal composite material spontaneously ignites at about 200°C., producing waste gases and an ash material. The ash contains mixed previous elemental metals and metal oxides salts and slags which are suitable for immediate electric arc furnace reduction in preparation for the formation of cast anodes from which pure metals are ultimately recovered.

In other embodiments, additional combustible material is added to or burned with the composite material. In other embodiments, portions of the initial separation of the composite material is accomplished with the aid of surface active agents, or with ultrasonic energy, or both. In some instances, the composite materials are separated from one another by metal types prior to metal recovery.

## 3,819,364
## WELDING HARD METAL COMPOSITION

**Fritz Frehn, Krefeld, Germany, assignor to Deutsche Edelstahlwerke GmbH, Krefeld, Germany**

**Filed Sept. 29, 1972, Ser. No. 293,404**
**Claims priority, application Germany, Oct. 6, 1971, 2149772**
**Int. Cl. C22c *37/00*; B22t *3/00***
**U.S. Cl. 75—122** **4 Claims**

A welding hard metal composition comprising a hardenable or hardened steel matrix bonding metal carbide particles, has a composition making it particularly adapted for deposition on steel and particularly on a hard metal composition of metal carbide particles bonded by a steel matrix.

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## 3,819,365
## PROCESS FOR THE TREATMENT OF MOLTEN METALS

**James Lindsay McCaulay, and Clifford Matthew Dunks, both of Reigate, England, assignors to Materials and Methods Limited, Surrey, England**

**Filed Mar. 13, 1970, Ser. No. 19,404**
**Claims priority, application Great Britain, Mar. 13, 1969, 13289/69**
**Int. Cl. C22c *37/00*; B22d *27/18***
**U.S. Cl. 75—130 R** **8 Claims**

The invention relates to a process for the treatment of molten metals with reactive additives whereby the reactive additive is added into the molten metal at a point between the pouring of the molten metal from the melting container and the entry of the molten metal into a casting mould. The additive is contained within a reaction chamber positioned between the ladle and the mould the demensions of the chamber being such that there is always adequate molten metal present in the chamber to cover the additive.

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## 3,819,366
## DENTAL ALLOY

**Michel Katz, Forest Hills, N.Y., assignor to Aurium Research Corporation, Long Island City, N.Y.**

**Continuation-in-part of Ser. No. 809,381, March 21, 1969, Pat. No. 3,667,936. This application June 5, 1972, Ser. No. 259,856The portion of the term of this patent subsequent to June 6, 1989, has been disclaimed.**
**Int. Cl. C22c *5/00***
**U.S. Cl. 75—172 R** **8 Claims**

A precious alloy for use in dental frames on which ceramic coverings or acrylic coverings are formed. Palladium is used in an amount ranging between 8 and 76 weight percent and indium is used in an amount ranging between 0.2 and 18 weight percent. The remainder of the alloy consists primarily of gold, or gold and silver, or silver and small amounts of trace metals. Zinc may also be included as part of the alloy. With such an alloy, there is no need for the use of platinum as in the prior art dental alloys and such alloys, according to this invention, have the same desirable characteristics as those of the prior art.

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## 3,819,367
## IMAGING SYSTEM

**Arun K. Chatterji; Marianne Custazzo; Demosthemes K. Kiriazides, all of Webster, N.Y.; John J. Russell, Jr., Tyrone, Pa., and John P. Serio, Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn., by said John J. Russell, Jr.**

**Division of Ser. No. 39,856, May 20, 1970. This application Sept. 25, 1972, Ser. No. 292,234**
**Int. Cl. G03g *13/08***
**U.S. Cl. 96—1 SD** **2 Claims**

A developer material comprising colored toner particles having a particle size less than about 30 microns and a minor proportion of submicroscopic silicon dioxide additive parti-

cles having at least a portion of the silicon atoms on the outside surface of the silicon dioxide particles directly attached through an oxygen atom to another silicon atom which is in turn directly attached through a carbon linkage to one to three organic groups.

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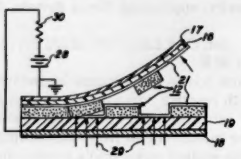
### 3,819,368
### MANIFOLD IMAGING MEMBER EMPLOYING A FIXATIVE LAYER

**Ray H. Luebbe, Jr., Rochester, N.Y., and John F. Byrne, Worthington, Ohio, assignors to Xerox Corporation, Rochester, N.Y.**

**Division of Ser. No. 845,343, July 28, 1969, Pat. No. 3,653,889. This application July 19, 1971, Ser. No. 164,046**
**Int. Cl. G03g** *5/00*
**U.S. Cl. 96—1.5** **7 Claims**




This invention pertains to an imaging system wherein there is employed a structure comprising a cohesively weak electrically photosensitive imaging layer sandwiched between a donor sheet and a receiver sheet. Images are produced by rendering the imaging layer cohesively weak by treatment with an activator and while subjecting the imaging layer to an electric field, it is exposed to electromagnetic radiation to which it is sensitive. With the field still applied, the sandwich is separated whereby the imaging layer fractures with the exposed portion of the imaging layer residing on one of the sheets and the unexposed portion residing on the other sheet. Images of superior quality are provided by inserting between the donor sheet and the imaging layer a solvent softenable layer which acts as a fixative for the image produced. Such images when formed on transparent donor sheets, are particularly useful as transparencies which project a bright color image.

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### 3,819,369
### SURFACE DEFORMABLE IMAGING MEMBER OF IMPROVED DARK DECAY CHARACTERISTICS

**Michael P. Trubisky, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.**

**Filed Sept. 5, 1972, Ser. No. 286,483**
**Int. Cl. G03g** *5/10*
**U.S. Cl. 96—1.5** **14 Claims**

An integral imaging member used for formation of a frost imaging pattern on the surface thereof is disclosed which comprises; a transparent substrate, a conductive layer over said substrate, an arsenic triselenide photoconductive layer, with a frostable thermoplastic layer on the outer surface of said member on which the frost image pattern is formed. Between the photoconductive and conductive layer a blocking layer is interposed to reduce dark decay characteristics of the photoconductive layer upon charging thereof, said layer comprising a phenoxy or epoxy resin with a thickness of between about 200 and 4,000 Angstroms.

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### 3,819,370
### PHOTOCONDUCTIVE ELEMENT AND PROCESS OF PREPARING SAME USING THERMO-SHRINKABLE MATERIAL

**Takao Komiya, Yokohama; Takashi Ihara, Kawasaki; Takehiko Matsuo; Umi Tosaka, both of Tokyo; Hirokazu Negishi, Yokohama, and Katsunobu Ohhara, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 828,658, May 28, 1969, abandoned. This application Oct. 26, 1972, Ser. No. 301,051**
**Claims priority, application Japan, June 4, 1968, 43-37748; June 6, 1968, 43-39133; Aug. 21, 1968, 43-59755; Aug. 21, 1968, 43-59762; Aug. 22, 1968, 43-60161**
**Int. Cl. G03g** *5/08*
**U.S. Cl. 96—1.5** **30 Claims**

A photosensitive member for electrophotography comprising an endless substrate, a photoconductive layer overlying the substrate and a seamless insulative layer overlying the photoconductive layer, is produced by applying a photoconductive layer to the substrate, loosely encircling such applied photoconductive layer and substrate with a thermally-shrinkable endless resin film and heating the film into continuous contacting relation with the photoconductive layer.

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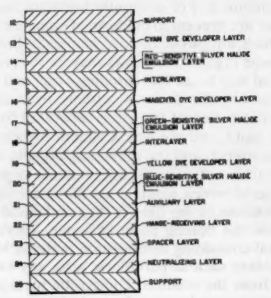
### 3,819,371
### NOVEL PRODUCTS AND PROCESSES

**Ronald A. Sahatjian, Watertown, and Lloyd D. Taylor, Lexington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.**

**Filed Mar. 6, 1972, Ser. No. 231,835**
**Int. Cl. G03c** *7/00, 5/54, 1/40*
**U.S. Cl. 96—3** **23 Claims**




Novel photographic products for use in diffusion transfer systems for forming visible images, particularly systems for forming color images viewable, without separation as color reflection prints, which products include a neutralizing layer for lowering the environmental pH after application of an aqueous alkaline processing fluid, the neutralizing layer comprising a water-soluble acidic compound and a hydrophobic reagent obtained from a water-soluble precursor contained in the aqueous coating solution employed to prepare the neutralizing layer.

## 3,819,372
## FILM ELEMENT AND METHOD FOR PRODUCTION OF SPATIALLY DISTINCT DYE AND SILVER PHOTOGRAPHIC IMAGES

**Norman Newman, and Richard S. Fisch, both of Saint Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

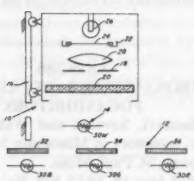
**Filed June 13, 1972, Ser. No. 262,179**
**Int. Cl. G03c** *7/24, 5/50*
**U.S. Cl. 96—4** **18 Claims**

A silver halide photographic color film element which includes a separate layer containing silver in an amount at least equivalent to the total silver in remaining dye forming silver halide layers of said element. The element may be used in a method wherein differential exposure thereof to desired dye and silver images, followed by differential development, bleaching and fixing, provides the element with spatially distinct dye and silver images.

## 3,819,373
## APPARATUS FOR DETERMINING EXPOSURE PARAMETERS FOR MAKING PRINTS FROM COLOR TRANSPARENCIES

**Arthur J. Sable, Boulder, Colo., assignor to Sable Photo Works, Inc., Boulder, Colo.**

**Filed May 8, 1972, Ser. No. 251,051**
**Int. Cl. G03c** *1/16*
**U.S. Cl. 96—23** **16 Claims**



This invention relates to a method and apparatus for determining a set of exposure parameters for making prints from positive or negative color transparencies. The apparatus comprises diffusion means for breaking up the full-color image to a degree where integrated component illumination readings may be taken thereof; filter means operative to selectively pass red, blue or green light; illumination-level comparison means operative to indicate when the level of illumination of two like color components equal one another; a calibrated light-flux attenuator of a type adapted to cooperate with the illumination level comparison means to define the time interval correction necessary to equate the total quantity of light delivered by like components at different levels of illumination; and, an uncalibrated light-flux attenuator adapted to vary the level of illumination of all three color components of a full-color projected image equally either up or down and in so doing cooperate with the illumination level comparison means to validate the scale of the calibrated light-flux attenuator. The novel method comprises choosing a time interval for one of the three primary color components of the unknown transparency equal to that of the like component of the standard transparency found to produce a satisfactory response in the color print-making material; attenuating the light-flux of the chosen component of the unknown transparency to the same predetermined degree said component was attenuated in the standard transparency for calibration purposes; matching the level of illumination of the chosen component of the unknown transparency to the reference level of the like component of the standard transparency by changing the levels of illumination of all three components to the same degree independently of the previous attenuation; matching the level of illumination of a second component of the unknown transparency to the reference level of illumination of the like component of the standard transparency by independently varying the level of illumination of said second component relative to the other two; correcting the exposure time for said second component by the interval necessary to compensate for the degree to which the level of illumination thereof had to be changed before it matched the reference level of illumination of the like component from the standard transparency; matching the level of illumination of the third component of the unknown transparency to the reference level of illumination of the like component of the standard transparency by independently varying the level of illumination of said third component relative to the first and second; and, correcting the exposure time for said third component by the interval necessary to compensate for the degree to which the level of illumination thereof had to be changed before it matched the reference level of illumination of the like component from the standard transparency.

## 3,819,374
## COMPOSITIONS FOR TREATING SILVER IMAGES

**Rodney J. Kemp, London, England, assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Sept. 7, 1972, Ser. No. 287,196**
**Claims priority, application Great Britain, Sept. 10, 1971, 42274/71**
**Int. Cl. G03l** *5/54;* **G03f** *7/02*
**U.S. Cl. 96—29 L** **22 Claims**

A composition for treating a silver image, such as that obtained by the photographic silver salt diffusion transfer process on a hydrophilic surface, comprises an acidic aqueous solution containing:

a. a long chain organic non-aromatic cationic compound, such as a long chain organic quaternary ammonium compound, or a long chain organic sulphonium compound,
b. iodide ions, and
c. a heterocyclic organic compound which has a nitro group bonded to an aromatic nucleus, such as 1-(2',4'-dinitrophenyl) pyridinium chloride, or an organic cationic compound having an aromatic group but no nitro group.

A printing plate comprising a hydrophilic surface having a silver image thereon which has been treated with this composition, and a process for preparing said plate comprising contacting a silver image on a hydrophilic surface with this composition, are taught.

## 3,819,375
## RELIEF IMAGES

**Arnold Hoffman, Brookline, Mass., assignor to Polaroid Corporation, Cambridge, Mass.**

**Continuation-in-part of Ser. No. 93,439, Nov. 27, 1970, Pat. No. 3,695,876. This application Sept. 28, 1972, Ser. No. 292,866The portion of the term of this patent subsequent to Oct. 3, 1989, has been disclaimed.**
**Int. Cl. G03c** *5/00*
**U.S. Cl. 96—35** **5 Claims**

Relief images are prepared in a sheet of silver having a surface of silver bromide.

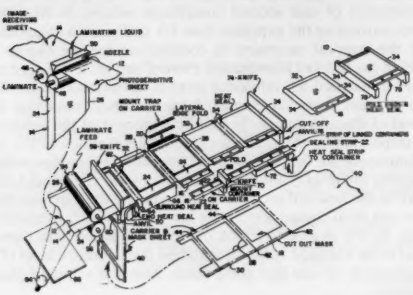
## 3,819,376
## SENSITOMETRIC MODIFICATION BY PRE-EXPOSURE

**Edwin H. Land, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.**

**Filed Oct. 25, 1972, Ser. No. 300,710**
**Int. Cl. G03c** *5/32, 7/00, 7/16, 1/76, 1/40;* **B05c** *9/08;* **B44d** *1/02;* **C03c** *15/00;* **D21f** *11/00;* **B22d** *45/00*
**U.S. Cl. 96—45.2** **29 Claims**

The sensitometric properties of multicolor diffusion transfer film units may be modified after the photosensitive element

has been coated. Sensitometric modification is effected by a uniform exposure of the photosensitive element to light of a predetermined intensity and wavelength range. In accordance



with this invention, the slopes of one or more of the individual D log E curves may be modified to bring said curves into a more parallel relationship with each other.

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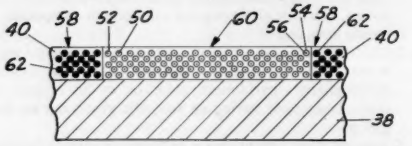
**3,819,377**

**METHOD OF IMAGING AND IMAGING MATERIAL**

**Peter M. Klose, Troy, and Stanford R. Ovshinsky, Bloomfield Hills, both of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.**

**Filed Aug. 12, 1971, Ser. No. 171,104**
**Int. Cl. G03c** *5/24, 5/04, 5/50*
**U.S. Cl. 96—48 R** **36 Claims**




In an imaging material, which normally produces upon imaging and development an image of one normal polarity (positive or negative), the trapping level is selectively controlled to produce, upon imaging and development, an image of the opposite polarity. This may be achieved, for instance, by adding a trap former to the imaging material, to produce, after selective activation of the trap former, for instance, by energy, the desired differential of the trapping levels in the image and non-image areas.

Also imaging materials comprising a trap former.

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**3,819,378**

**FINE GRAIN HIGH SPEED PHOTOGRAPHIC PROCESSING MONOBATH COMPOSITION**

**Daniel Earle Speers, Southport, Conn., assignor to General Film Development Corporation, Southport, Conn.**

**Filed Mar. 10, 1972, Ser. No. 233,787**
**Int. Cl. G03c** *5/38, 5/30*
**U.S. Cl. 96—61 M** **4 Claims**

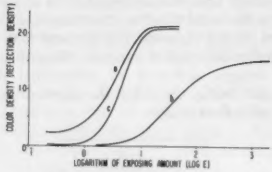
An improved combined developer-fixer photographic processing monobath composition and method for use thereof, providing rapid and even development while maintaining fine grain structure and producing good image quality and extended processing life, including at least in excess of 100 grams of anhydrous sodium sulphite per liter of solvent in the working monobath solution. The developer may be a combination of two developing agents and a cationic surface-active agent may be added.

**3,819,379**

**SILVER HALIDE PHOTOGRAPHIC MATERIAL FOR USE IN COLOR PHOTOGRAPHY**

**Yasushi Ohyama, and Hideo Sumitani, both of Kyoto, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan**

**Filed Jan. 18, 1973, Ser. No. 324,708**
**Claims priority, application Japan, Jan. 20, 1972, 47-7854**
**Int. Cl. G03c** *1/34, 1/02*
**U.S. Cl. 96—68** **4 Claims**




A multilayer silver halide photographic material for color photography comprising silver halide photographic emulsion layers and auxiliary layers containing no silver halide emulsion, wherein either the emulsion layers or the auxiliary layers contain an anionic development inhibitor such as sodium 2-mercapto-3-ethyl-benzimidazole-6-sulfonate in the form of a complex with a cationic polymer such as a benzyl chloride salt of a dimethylaminoethanol ester of polymethacrylic acid. In alkalinity, the inhibitor is instantly released from the complex and acts to inhibit the formation of development fog sufficiently.

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**3,819,380**

**AZODICARBONAMIDINE SALTS AS SILVER HALIDE FOG INHIBITORS**

**Agostino Baldassarri, Savona, and Walter Ferro, Quiliano, both of Italy, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Filed Apr. 18, 1972, Ser. No. 245,681**
**Claims priority, application Italy, Apr. 29, 1971, 50035/71**
**Int. Cl. G03c** *1/34*
**U.S. Cl. 96—76 R** **9 Claims**

Azodicarbonamidine salts as a class inhibit fog formation in silver halide emulsions when contacted therewith.

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**3,819,381**

**DYE DIFFUSION TRANSFER FILM CONTAINING ALKALI-DISSOCIABLE INORGANIC SALTS**

**Frederick C. Barstow, Concord, and Carole J. Uhrich, Belmont, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.**

**Filed Jan. 10, 1972, Ser. No. 216,717**
**Int. Cl. G03c** *1/40, 7/00, 5/54, 1/28*
**U.S. Cl. 96—77** **20 Claims**

Integral negative-positive film units adapted for forming multicolor transfer images, which film units include

a negative component comprising a blue-sensitive, a green-sensitive and a red-sensitive gelatino silver halide emulsion having associated therewith in a contiguous layer, respectively, a yellow dye developer, a magenta dye developer and a cyan dye developer, at least one set of said emulsion layers and associated dye developer layers being separated from another set of emulsion layers and associated dye developer layers by an interlayer comprising a dye impermeable coalesced essence of an aqueous film-forming polymer dispersion and a processing composition permeable material associated therewith and adapted to render the interlayer permeable to solubilized dye image-forming material subsequent to being contacted with an aqueous alkaline processing composition;

a positive component including a least a dyeable stratum and preferably also a pH-reducing layer; and

means for providing a reflecting layer between the positive and negative components so that a multicolor transfer image imparted to the dyeable stratum may be viewed as a reflection print without separation of the positive and negative component, which means may comprise a preformed layer disposed between the negative and positive components or a reagent or combination of reagents to be applied to the exposed film unit to provide the reflecting layer;

wherein at least the coating solution employed to provide a silver halide emulsion layer contiguous with said interlayer includes an alkali-dissociable inorganic salt to obtain greater transfer of the associated dye to the positive component in terms of the exposed areas of the associated silver halide layer.

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### 3,819,382
### LIGHT-SENSITIVE MATERIAL HAVING DEVELOPERS EMBEDDED THEREIN

**Anita Von Konig, Leverkusen; Helmut Kampfer; Ernst Roos, both of Cologne, and Kurt Ley, Leverkusen, all of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany**

**Filed June 23, 1971, Ser. No. 156,047**

**Claims priority, application Germany, June 26, 1970, 2031748**

**Int. Cl. G03c** *1/02*

**U.S. Cl. 96—114.1** **3 Claims**

Light-sensitive photographic material having reducible metal compound that forms metal nuclei when exposed to light, and also has reducing agent incorporated in it to form an image when processed without an external developer, shows greater storage stability when the reducing agent is selected from certain hydroxy chromans and coumaranes. The reducible metal compound can be a compound of silver or other Group Ib metal, and can be formed in situ from a non-light sensitive silver salt.

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### 3,819,383
### SUPER-SENSITISING COMBINATION IN PHOTOGRAPHIC SILVER HALIDE EMULSION

**Elaine Josephine Squire, and Aaron David Ezekiel, both of Ilford, England, assignors to Ilford Limited, Ilford, England**

**Filed July 11, 1972, Ser. No. 270,702**

**Claims priority, application Great Britain, July 12, 1971, 32615/71**

**Int. Cl. G03c** *1/14*

**U.S. Cl. 96—124** **4 Claims**

The present invention relates to a photographic silver halide emulsion which comprises a super-sensitising combination, which consists of (I) a 5-alkoxy-naphthothia-zole-2-benzothiazole or selenazole-trimethinecyanine and (II) a bis-2-benzothiazole-trimethinecyanine.

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### 3,819,384
### FLAME SPRAYING WITH POWDER BLEND OF FERROMOLYBDENUM ALLOY AND SELF-FLUXING ALLOYS

**Herbert Smith Ingham, Jr., Northport, and Edward Robert Novinski, Mineola, both of N.Y., assignors to Metco, Inc., Westbury, N.Y.**

**Filed Jan. 18, 1973, Ser. No. 324,724**

**Int. Cl. C23c** *7/00*

**U.S. Cl. 106—1** **6 Claims**

A flame spray powder comprising a mixture of a self-fluxing alloy powder and about 5–95 percent by weight, based on the total thereof with said self-fluxing alloy powder, of a ferromolybdenum alloy comprising by weight about 50 to 75 percent of molybdenum and about 50 to 25 percent of iron, which powder is characterized by forming in its flame-sprayed condition an adherent porous coating on a substrate.

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### 3,819,385
### METHOD FOR APPLYING A PHOSPHATE COATING TO IRON AND STEEL

**Helmut Schumichen, Frankfurt, and Gerhard Muller, Hanau, both of Germany, assignors to Oxy Metal Finishing Corporation, Warren, Mich.**

**Filed Aug. 31, 1972, Ser. No. 283,446**

**Claims priority, application Germany, Sept. 2, 1971, 2143957**

**Int. Cl. C09d** *5/12*

**U.S. Cl. 106—14** **9 Claims**

Disclosed is a method and composition useful for applying a phosphate coating to an iron or steel surface. The surface is contacted with an aqueous solution containing acidic zinc phosphate, chlorate ion and between 0.1 and 10 mg/l vanadium, calculated as $V_2O_5$, at a temperature of less than 65°C.

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### 3,819,386
### RHEOLOGY MODIFIERS FOR INKS

**William Albert Higgins, Gates Mills, and Irwin Robert Ehren, Cleveland Heights, both of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio**

**Filed Dec. 20, 1971, Ser. No. 210,202**

**Int. Cl. C09d** *11/06*

**U.S. Cl. 106—27** **13 Claims**

A dispersion comprising a non-polar organic liquid, an alkaline earth metal salt of a fatty acid or substituted fatty acid, and a dispersant is effective as a rheology modifier for imparting plastic flow to printing inks. The dispersant is characterized by the presence therein of at least one acyl, acyloxy or acylimidoyl group, typically derived from a carboxylic acid having at least about 50 carbon atoms, and at least one radical containing a nitrogen or oxygen atom connecting said acid-derived group to a hydrocarbon or substituted hydrocarbon radical.

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### 3,819,387
### HEAT DEVITRIFIABLE GLASS

**Lucien Leger, Montigny-Le Tilleul, and Jules Bray, Roux, both of Belgium, assignors to Glaverbel S.A., Watermael-Boitsfort, Belgium**

**Continuation of Ser. No. 853,528, Aug. 27, 1969, abandoned, which is a continuation-in-part of Ser. No. 558,602, June 20, 1966, abandoned. This application Jan. 20, 1972, Ser. No. 219,511**

**Claims priority, application Luxembourg, June 25, 1965, 48911**

**Int. Cl. C03c** *3/22*

**U.S. Cl. 106—39.6** **11 Claims**

Heat-devitrified glass having high mechanical strength and extremely well-suited for ballotini is prepared from inexpensive constituents, such as sand, alumina or feldspar, dolomite and limestone.

The composition from which the heat-devitrified glass is prepared is virtually free from lithium oxide and, per 100 parts by weight, consists essentially of from 44 to 66 parts by weight of $SiO_2$, from 13 to 21 parts by weight $Al_2O_3$, from four to nine and six tenths parts by weight of CaO and from five to 15 parts by weight of MgO; the sum of the parts by weight of $SiO_2$, $Al_2O_3$, CaO and MgO being at least 80; the ratio of the parts by weight of $SiO_2$ to the parts by weight of $Al_2O_3$ being from 3.1 to 3.5:1; the ratio of the sum of the parts by weight of $SiO_2$ and $Al_2O_3$ to the sum of the parts by weight of CaO and MgO being from 2.3:1 to 4:1; and any further ingredient, in the amount thereof present, constitutes means for permitting devitrification by heat of glass of the composition.

3,819,388

## FIREPROOFING, INSULATION AND SOUNDPROOFING MATERIAL

Charles E. Cornwell, 7104 Marian Dr., Alexandria, Va. 22307

Filed June 5, 1972, Ser. No. 259,742
Int. Cl. C04b 7/02, 11/00
U.S. Cl. 106—86 4 Claims

Method for the preparation of a cementitous composition having a cellular structure for protecting steel and other structural elements from fire. By spraying directly upon the desired structural substrate; a composition containing gypsum cement, filler or lightweight aggregates, water, and ½ percent to 2 percent by weight of a non ionic detergent such as a polyethylene glycol ether combined with 9 moles of ethylene oxide. This same composition is suitable and useful for thermal insulation and acoustical soundproofing. It can be mixed and applied in well known conventional techniques, such as spraying, casting or trowled. Portland cemenet or magnesia cements may be substituted for gypsum cement with similar results.

3,819,389

## PROCESS FOR MANUFACTURING A RAPID HARDENING PORTLAND CEMENT

Hiroshi Uchikawa, and Noboru Kasai, both of Tokyo, Japan, assignors to Onoda Cement Co., Ltd., Onoda-shi, Yamaguchi, Japan

Filed Nov. 27, 1972, Ser. No. 309,805
Claims priority, application Japan, Nov. 26, 1971, 46-94440
Int. Cl. C04b 7/02
U.S. Cl. 106—100 15 Claims

This invention relates to a process for manufacturing a modified rapid hardening portland cement of which a setting time is convenient even at low temperature, which comprises mixing calcium carbonate, sodium carbonate, potassium carbonate and/or magnesium carbonate, or a mixture of said carbonate and sodium sulfate, potassium sulfate, aluminium sulfate and/or magnesium sulfate with a clinker which mainly consists of a calcium halo-aluminate having the formula $11CaO \cdot 7Al_2O_3 \cdot CaX_2$, intergrinding the mixture and then mixing finely powdered anhydrite with the ground mixture to manufacture cement in an amount such that the weight ratio of $Al_2O_3/SO_3$ in the cement is 0.6–1.8.

3,819,390

## LIPOPHILIC CELLULOSE SPONGES

James Teng, and Marcella C. Stubits, both of St. Louis, Mo., assignors to Anheuser-Busch Incorporated, St. Louis, Mo.

Filed Jan. 24, 1972, Ser. No. 220,393
Int. Cl. B29d 3/10; C08b 3/10
U.S. Cl. 106—122 2 Claims

This disclosure concerns a cellulose fatty acid ester sponge which picks up oil and non-polar solvents. The sponge has a bulk density of 0.02g/cm³ to 0.06g/cm³ and the degree of substitution of the cellulose is 1.2 to 2.9. The sponge is made by reacting a cellulose sponge with fatty acid derivatives, specifically lauroyl chloride, under controlled conditions. The esterified sponge has a bulk density of 0.5 to 3g/cm³.

3,819,391

## ADDITIVE FOR CEMENTITIOUS MIXTURES

Robert C. Sefton, Bridgeville, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Nov. 2, 1970, Ser. No. 86,187
Int. Cl. C08h 13/02
U.S. Cl. 106—273 R 5 Claims

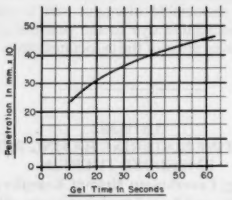
A solid, flake-like composition of matter which consists of a bituminous material distributed throughout a surfactant is disclosed. The composition of matter when charged to water disperses quickly and evenly. This facility of dispersion makes the composition of matter an easy to use additive for cementitious mixtures particularly lightweight cementitious mixtures using expanded polystyrene particles as an aggregrate.

3,819,392

## NON-AQUEOUS QUATERNARY AMMONIUM SILICATE SOLUTIONS

Helmut H. Weldes, Havertown; John S. Stephen Bobb, Springfield, both of Pa., and M. Robert Derolf, Blackwood, N.J., assignors to Philadelphia Quartz Company, Valley Forge, Pa.

Continuation of Ser. No. 853,245, Aug. 27, 1967, abandoned.
This application Apr. 24, 1972, Ser. No. 246,863
Int. Cl. B28b 7/34
U.S. Cl. 106—287 SE 11 Claims




Substantially non-aqueous solutions of a group of alkylalkanol quaternary ammonium silicates are prepared from the corresponding aqueous systems by substituting a miscible organic solvent. The miscibility may be varied by changing the alkylamine precursor of the quaternary ammonium silicate. Stable alkaline and acidic systems are formed which will set upon neutralization.

3,819,393

## CEMENT EXPANDING AGENT

Yoshizo Ono, No. 230, and Tsutomu Mizunuma, 111, Ohaza-Ohmi, both of, Nishikubiki-gun, Japan

Filed June 21, 1972, Ser. No. 265,036
Claims priority, application Japan, June 26, 1971, 46-46505
Int. Cl. C04b 13/00
U.S. Cl. 106—314 1 Claim

A calcium sulfoaluminate series cement expanding agent having a specific particle size distribution. This cement expanding agent is not influenced by the variation of curing condition and can develop a high expandability in the concrete.

3,819,394

## PROTECTIVE COATING FOR ACTIVATED RESINOUS SUBSTRATES

Frederick W. Schnebel, Jr.; Edward J. Leech, both of Oyster Bay, and Joseph Polichette, South Farmingdale, all of N.Y., assignors to Photocircuits Division of Kollmorgen Corporation, Hartford, Conn.

Filed Dec. 13, 1972, Ser. No. 314,548
Int. Cl. B44d 1/14
U.S. Cl. 117—6 17 Claims

There are provided articles of manufacture comprising bodies having outwardly presented resinous surfaces containing active bonding sites for electroless metal deposition and a strippable protective coating on the active surfaces, the coating comprising a resinous layer resistant to the penetration of external forces and substances which tend to deactivate the bonding sites and the coating being cleanly strippable from the body, preferably by applying a selective solvent for the coating material.

3,819,395

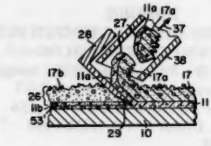
## SIMULATED MASONRY WALL

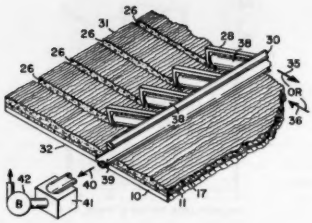
Tommy E. Yocum, 2102 Mayflower Dr., Middleton, Wis. 53562

Filed Aug. 23, 1971, Ser. No. 174,098
Int. Cl. B44c 1/22
U.S. Cl. 117—8 22 Claims

Simulated masonry wall panels are made by first coating a base panel structure with a base coat to simulate mortar and then coating the base coat with a finish coat layer. Both layers

may be cementitious. Simulated mortar joints are provided by simultaneously cutting each of several sets of grooves extending to, into or through the base layer with a plurality of knife





members having their knife edges guided above the surface of the base panel structure. All grooves in each set are cut by a single translatory movement of the knife members with respect to the base panel structure.

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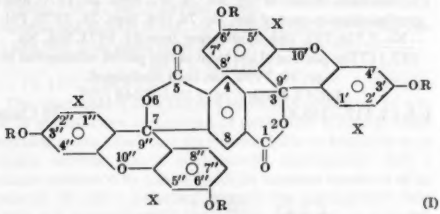
## 3,819,396
## DILACTONE CHROMOGENIC COMPOUNDS, PREPARATION THEREOF, AND PRESSURE-SENSITIVE COPY SYSTEMS EMPLOYING SAME

**David N. Vincent, Glenview, and Cheng Hsiung Chang, Chicago, both of Ill., assignors to Champion International Corporation, New York, N.Y.**

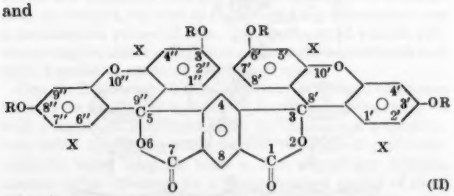
**Filed Feb. 5, 1973, Ser. No. 329,293**
**Int. Cl. B41c** *1/06*
**U.S. Cl. 117—36.2** **12 Claims**

A substantially colorless dilactone chromogenic material having the structural formula



(I)

and



(II)

wherein

R represents an alkyl group, an aryl group, an aralkyl group, an acyl group or an aroyl group; and

X represents a hydrogen atom, a halogen atom, an alkyl group or a nitro group.

The dilactone compounds are produced from precursor compounds that are formed by reacting pyromellitic dianhydride with a resorcinol having at least the fourth or the sixth position unsubstituted, in the presence of a dehydrating agent to form xanthyl derivatives of isophthalic and terephthalic acid. These precursors are then further reacted to form the dilactones. The dilactones are used in pressure-sensitive copy systems comprising a support bearing microcapsules containing the dilactones, alone, or in combination with other chromogenic materials.

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## 3,819,397
## METHOD OF FORMING IMPROVED PRESSURE SENSITIVE TRANSFER MEDIA

**Gerry H. Ehrhardt, 1705-19th St., West Des Moines, Iowa 50309, and Timothy G. Abernathy, 8621 Primrose Ln., Clive, Iowa 50053**

**Continuation-in-part of Ser. No. 858,362, Sept. 16, 1969, abandoned. This application Dec. 8, 1971, Ser. No. 205,940**
**Int. Cl. B41m** *5/10*
**U.S. Cl. 117—36.1** **11 Claims**

Process for forming image transfer media of improved character by coating a substrate with a uniform dispersed suspension of a filler, coloring matter and a solvent having a wax-like material dissolved therein and thereafter precipitating said wax-like material, in situ, by rapidly cooling the applied suspension with concurrent evaporation of the solvent.

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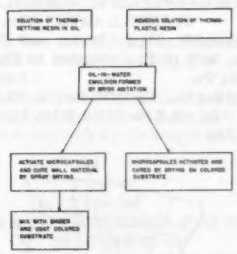
## 3,819,398
## PROCESS FOR PRODUCTION OF PRESSURE-SENSITIVE COPY SHEET

**Mabrin P. Powell, Chicago, and Mark R. Nauman, Lake Forest, both of Ill., assignors to Champion International Corporation, New York, N.Y.**

**Division of Ser. No. 55,924, July 17, 1970, Pat. No. 3,686,015. This application Apr. 28, 1972, Ser. No. 248,594**
**Int. Cl. B41m** *5/16, 5/18*
**U.S. Cl. 117—36.7** **16 Claims**



A dry, pressure-sensitive copy system is provided by coating discrete, substantially spherical air-containing microcapsular opacifying agents having controlled structural integrity onto a colored surface. Localized application of pressure to the coating causes destruction of the opacifying agents and exposes the underlying colored surface at the points of pressure application thereby producing an image.

## 3,819,399
## TREATING METAL CLAD STEEL WIRE FOR APPLICATION OF ORGANIC ADHESIVE

**Robert Henry Campbell; Charles Phillip Rader, and Robert Lee Wright, all of Akron, Ohio, assignors to Monsanto Company, St. Louis, Mo.**

**Filed July 26, 1972, Ser. No. 275,202**
**Int. Cl. B44d** *1/42, 1/48;* **C03c** *25/02*
**U.S. Cl. 117—49** **8 Claims**

In the application of organic adhesive to metal, steel wire coated with a different metal is passed serially through treating zones, in one of which an entire surface layer of the coating metal is removed and in a subsequent zone an organic adhesive is applied.

## 3,819,400
## SURFACE PROTECTION OF POROUS MATERIALS

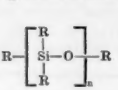
**Leo Hans Plankl, Rechklinghausen; Claus-Dietrich Seiler, Rheinfelden, and Hans-Joachim Vahlensieck, Wehr/Baden, all of Germany, assignors to Dynamit Nobel AG, Troisdorf, Germany**

**Filed Oct. 19, 1971, Ser. No. 190,684**
**Claims priority, application Germany, Oct. 29, 1970, 2053110**
**Int. Cl. C04b** *41/00;* **B08b** *3/00*
**U.S. Cl. 117—54** **4 Claims**

Improvements in surface protection of porous materials, particularly water prrofing masonry surfaces, by first impinging on the surface of such masonry liquid hot or cold water or steam under pressure, and then impregnating the thus treated surface with a silane of the general formula:

$$R^2 - Si - (OR^1)_3$$

and/or a siloxane of the general formula:

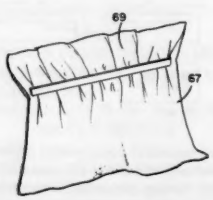


wherein:
R may be the same or different alkyl, alkenyl, aryl, cycloalkyl, cycloalkenyl, aralkyl or aralkenyl; $R^1$ is alkyl, hydroxyalkyl or alkoxyalkyl; $R^2$ is alkyl, alkenyl aryl, cycloalkyl, cycloalkenyl, aralkyl or aralkenyl; and *n* is at least 2. The impregnant may be applied while the surface is still wet from the water or steam pretreatment.

## 3,819,401
## METHOD OF PREPARING SHIRRED, ELASTIC, FLEXIBLE ARTICLES

**John T. Massengale, West Chester, and Walter T. Koch, Havertown, both of Pa., assignors to FMC Corporation, Philadelphia, Pa.**

**Filed Nov. 13, 1970, Ser. No. 89,304**
**Int. Cl. B29c** *27/20;* **B32b** *31/26*
**U.S. Cl. 156—85** **10 Claims**

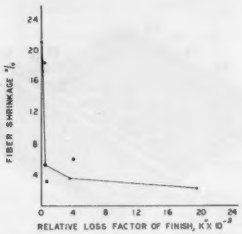



Method of preparing a shirred elastic, flexible article by attaching to a sheet material a thin layer of flexible, plasticized vinyl chloride polymer material which is heat shrinkable in only one direction thereof, and thereafter heating the layer of vinyl chloride material to effect shrinkage thereof and shirring of the sheet material which is attached thereto.

## 3,819,402
## PROCESS FOR HEAT SETTING CRIMPED SYNTHETIC POLYMERIC FIBER TOW

**Herbert T. Thrower, Jr., Spartanburg, S.C., assignor to Hystron Fibers Incorporated, Spartanburg, S.C.**

**Filed July 29, 1971, Ser. No. 167,156**
**Int. Cl. D06m** *11/04;* **H05b** *9/00*
**U.S. Cl. 117—93.1 DH** **3 Claims**



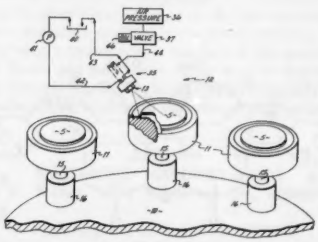

EFFECT OF LOSS FACTOR OF FINISH ON HOT AIR SHRINKAGE OF FIBER HEAT-SET IN AN OSCILLATING ELECTROMAGNETIC FIELD

An improved process is disclosed for the heating or heat treatment of a substrate, particularly a textile material in an oscillating electromagnetic field. The addition of ionic compounds to the material to be heated greatly enhances the heating or heat treatment of the material when subjected under proper moisture conditions to the effects of an oscillating electromagnetic field.

## 3,819,403
## METHOD AND APPARATUS FOR APPLYING WAX TO CAN ENDS

**Edwin F. Hogstrom, Sheffield Lake, Ohio, assignor to Nordson Corporation, Amherst, Ohio**

**Continuation-in-part of Ser. No. 76,167, Sept. 28, 1970, and a continuation-in-part of Ser. No. 76,168, Sept. 28, 1970, Pat. No. 3,726,711. This application June 11, 1971, Ser. No. 152,117The portion of the term of this patent subsequent to Apr. 10, 1990, has been disclaimed.**
**Int. Cl. B05b** *7/16, 13/02;* **B44d** *1/08*
**U.S. Cl. 117—105.4** **31 Claims**



A method and apparatus for applying a film of wax to the interior surface of a can end before that end is assembled onto the body of a can. The wax is applied by melting a 100% solids

wax and forcing it as a liquid without the addition of a solvent through an airless spray nozzle onto the rotating can end under conditions which result in a thin film of 100% solids wax being applied to the complete interior surface of the can end.

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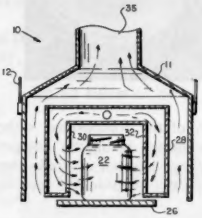
**3,819,404**

## METHOD FOR TREATING VITREOUS SURFACES

**Addison B. Scholes, and Joseph J. Kozlowski, both of Muncie, Ind., assignors to Ball Corporation, Muncie, Ind.**

**Filed Apr. 4, 1972, Ser. No. 240,960**
**Int. Cl. C23c** *11/08*
**U.S. Cl. 117—106 R** **5 Claims**




Apparatus and method for surface treating vitreous materials with treatment gases to form a smooth metallic oxide surface coating having constant thickness on the vitreous material. The apparatus, which is preferably an enclosure mounted over a conveyor belt and which includes an entrance and exit end, incorporates a plenum chamber or gas distribution means for distributing treatment gas highly diluted in an inert carrier gas such as dry air within the enclosure at high velocity. The method comprises applying the highly diluted treatment gas at high velocity to the vitreous surface to provide an efficient use of the treatment gas as well as a smooth metallic oxide coating having constant thickness on the vitreous material.

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**3,819,405**

## A METHOD OF PRODUCING A VOLATILIZING ARTICLE OF MANUFACTURE

**Walter H. Engle, Southport, Conn., assignor to Porosan Interests, U.S.A., Inc., Fairfield, Conn.**

**Continuation-in-part of Ser. No. 96,354, Dec. 9, 1970, Pat. No. 3,688,985. This application Apr. 17, 1972, Ser. No. 244,642**
**Int. Cl. A61l** *9/04*
**U.S. Cl. 117—138.8 UA** **5 Claims**

This disclosure is directed to a method of producing an article of manufacture comprising of preformed synthetic water insoluble resins which may be either soluble or insoluble in an organic solvent that is subsequently impregnated with a volatile substance by contact with an aqueous emulsion of an essential oil and a surfactant wherein the impregnated resin article will gradually yield the volatile substance in a chemically unchanged, dry state to the surrounding atmosphere over a considerable period of time. The impregnated volatile substance may be either a fragrance, a flavor, or a combination of both, a sanitising agent, or a medicinal agent.

One method by which the article may be formed comprises forming an emulsified solution of water and an essential oil with a surfactant and maintaining the emulsion at a temperature below the boiling point thereof. A supply of preformed synthetic water insoluble resin is then placed into intimate contact in the emulsion for a predetermined period of time. Upon the lapse of the predetermined period of time the synthetic resin may be removed from contact with the emulsion, and the excess liquid or emulsion removed therefrom so that the resulting impregnated article is rendered virtually dry to the touch.

An apparatus by which the method can be performed comprises a vessel which is preferably closed for containing the emulsion. An access opening is provided for inserting the synthetic water insoluble preformed resin thereinto and an egress opening is provided for effecting the removal of the impregnated resin therefrom. A drying means may be associated with the apparatus for effecting the drying of the removed resin to render it dry to the touch. In one form of the invention a squeegee means or wiper is disposed adjacent the egress opening for removing the excess emulsified solution from the impregnated resin as it is being withdrawn from the emulsion. Cooperatively associated adjacent the egress and the associated squeegee or wiper is a drying roller to render the impregnated resin dry to the touch. Alternatively a centrifuge may be utilized to effect the drying of the impregnated resin article.

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**3,819,406**

## HOT-DIP LEAD COATING

**Hironori Tachimori, Tokyo; Teiji Nagahori, Saitama-ken, and Yukio Nakamura, Tokyo, all of Japan, assignors to Mitsui Mining & Smelting Co. Ltd., Tokyo, Japan and Max-Coater Co., Ltd., Kawaguchi-shi, Saitama-ken, Japan**

**Continuation-in-part of Ser. No. 797,263, Feb. 6, 1969, abandoned. This application Oct. 27, 1971, Ser. No. 193,160**
**Claims priority, application Japan, Feb. 16, 1968, 43-9753; June 27, 1968, 43-44772; June 27, 1968, 43-44773; June 27, 1968, 43-44774**
**Int. Cl. C23c** *1/06*
**U.S. Cl. 117—114 R** **7 Claims**

Lead-base alloy, hot-dip coating of articles of iron, iron-base alloys, copper and copper-base alloys is accomplished, with improved hardness, corrosion resistance and appearance, using as a coating alloy one of the following (a), (b), (c) and (d):

a. an alloy containing 0.01–5.0 percent by weight of arsenic, the balance being lead metal,
b. an alloy containing 0.01–5.0 percent by weight of arsenic and 0.1–3.0 percent by weight of tin, the balance being lead metal,
c. an alloy containing 0.01–5.0 percent by weight of arsenic and 0.1–10.0 percent by weight of antimony, the balance being lead metal, and
d. an alloy containing 0.01–5.0 percent by weight of arsenic, 0.1–10.0 percent by weight of antimony and 0.1–3.0 percent by weight of tin, the balance being lead metal.

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**3,819,407**

## HIGH TEMPERATURE RESISTANT LAMINATES

**Alex N. Oates, Humble, Tex., and James T. Edmonds, Jr., Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.**

**Filed Mar. 9, 1972, Ser. No. 233,346**
**Int. Cl. B32b** *27/08;* **C08j** *1/40*
**U.S. Cl. 117—138.8 N** **4 Claims**

High temperature and erosion resistant laminates comprising a polyimide layer or substrate or other high temperature resistant polymer coated with a poly(arylene sulfide) resin are provided.

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**3,819,408**

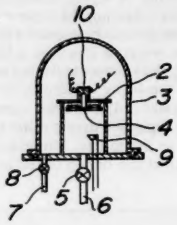
## METHOD FOR MANUFACTURING VAPOR DEPOSITED ELECTRODE

**Ryuya Toyonaga, Ebina-Machi, and Eikyu Hiruma, Tokyo, both of Japan, assignors to Nippon Hoso Kyokai, Tokyo, Japan**

**Filed Mar. 27, 1972, Ser. No. 238,513**
**Claims priority, application Japan, May 27, 1971, 46-36498**
**Int. Cl. B44d** *3/18;* **B44c** *1/18*
**U.S. Cl. 117—201** **6 Claims**

A method for manufacturing secondary emission electrode deposited on a thin supporting film by vacuum evaporation,

wherein a rigid body is arranged adjacent to a surface of the thin film opposite to the vaporizing surface. The opposite surfaces of the rigid body and the thin film may be arranged in parallel and at a distance, for example, about 0.05 mm or they




may be so arranged to increase the distance at locations radially more distant from the central portion of the thin film. An evaporating material is vapor deposited onto the supporting surface, thus a secondary emission electrode layer having a uniform thickness can be obtained.

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**3,819,409**

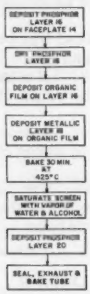
**METHOD OF MANUFACTURING A DISPLAY SCREEN**

**Donald M. Phillips, Cayuta, N.Y., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.**

**Filed July 26, 1972, Ser. No. 275,388**

**Int. Cl. H05b** *33/00, 33/28*

**U.S. Cl. 117—211** **9 Claims**


DEPOSIT PHOSPHOR LAYER 16 ON FACEPLATE 14
DEPOSIT ORGANIC FILM ON LAYER 16
DEPOSIT METALLIC LAYER 18 ON ORGANIC FILM
BAKE 30 MIN. AT 425°C
SATURATE SCREEN WITH VAPOR OF WATER & ALCOHOL
DEPOSIT PHOSPHOR LAYER 20
SEAL, EXHAUST & BAKE TUBE

An improved method of manufacturing a display screen for a cathode tube in which a coating of a material such as phosphor is provided on the back surface of the display screen and more particularly on the metallic backing of the display screen. This is accomplished by subjecting the metallic coated screen to a suitable vapor until the screen is saturated with vapor and then depositing the phosphor onto the back surface of the metallic backing layer by suitable screening techniques such as settling. The resulting structure is comprised of two phosphor layers with a metallic barrier sandwiched between the phosphor layers.

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**3,819,410**

**HIGH VOLTAGE INSULATED CONDUCTOR**

**Gerard W. Kuckro, and George E. Lorand, both of Cincinnati, Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.**

**Filed May 23, 1972, Ser. No. 256,046**

**Int. Cl. B44d** *1/42*; **H01b** *3/44*

**U.S. Cl. 117—232** **7 Claims**

A conductor having a high voltage insulation composition is disclosed wherein the insulating composition comprises unfilled, cross-linked low density ethylene homopolymers or ethylene-vinyl acetate copolymers having incorporated therein a synergistic anti-oxidant mixture of a hindered phenol and a zinc dialkyl dithiophosphate. The incorporation into the disclosed homopolymers or copolymers vastly improves the

oxidative stability of the composition without staining, and provides a high voltage insulation composition having an unexpectedly reduced number of voids, thereby making the composition especially suitable for insulating high voltage conductors.

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**3,819,411**

**FERROMAGNETIC CHROMIUM DIOXIDE COMPOSITION AND MAGNETIC RECORDING MEDIUM CONTAINING SAME**

**Tatsuji Kitamoto, and Yasuyuki Yamada, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanawaga, Japan**

**Filed Dec. 15, 1971, Ser. No. 208,433**

**Claims priority, application Japan, Dec. 16, 1970, 45-111732**

**Int. Cl. C01g** *37/02*

**U.S. Cl. 117—235** **7 Claims**

A ferromagnetic chromium dioxide composition for use as a magnetic material of a magnetic recording medium is produced from a mixture of the powders of ferromagnetic chromium dioxide or its derivative with a compound of an ion capable of forming a water-insoluble compound upon reaction with a hexavalent chromium ion, such as barium stearate or zinc oxide.

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**3,819,412**

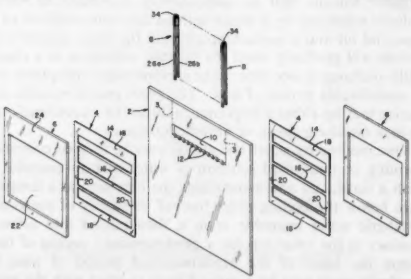
**PLATES FOR LEAD ACID BATTERIES**

**Alwyn H. Taylor, Boston; Jose Giner, Sudbury, and Franz Goebel, Marlboro, all of Mass., assignors to Tyco Laboratories, Inc., Waltham, Mass.**

**Filed Feb. 7, 1972, Ser. No. 224,176**

**Int. Cl. H01m** *39/06*

**U.S. Cl. 136—10** **19 Claims**



The invention is a new composite battery plate for lead acid batteries. The preferred embodiment is a bipolar plate charac-

terized by a plastic substrate as the support for the active positive and negative masses with lead strips on each substrate providing electrical conduction through the substrate. The battery plate makes possible a battery capable of supplying high rate power pulses and of accepting high rate charge pulses, both of short duration, and having a superior cycle life and improved energy density at high power density operating conditions.

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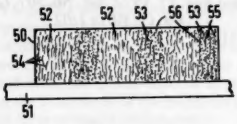
3,819,413

## RECHARGEABLE METAL ELECTRODE FOR STORAGE BATTERIES AND METAL-AIR CELLS

**Waldemar Nippe, and Dieter Groppel, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany**

**Filed Dec. 11, 1972, Ser. No. 313,923**
**Claims priority, application Germany, Dec. 23, 1971, 2164208**
**Int. Cl. H01m** *43/04*
**U.S. Cl. 136—25** **15 Claims**




A rechargeable metal electrode for storage batteries and metal-air cells comprising active electrode material and a framework of substantially parallel fibers of electrically conductive material substantially perpendicular to the electrode surface as a carrier for the active electrode material, such that there exist alternating areas of coarse and fine pores, the coarse-pored areas consisting essentially of the framework and the fine-pored areas consisting essentially of the framework and the active electrode material.

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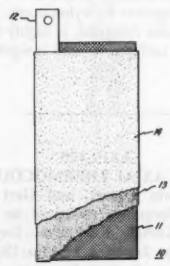
3,819,414

## STORAGE BATTERY AND POSITIVE ELECTRODE THEREFOR

**Dale F. Taylor, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.**

**Filed Oct. 2, 1972, Ser. No. 294,023**
**Int. Cl. H01m** *39/00, 35/02*
**U.S. Cl. 136—26** **6 Claims**




A storage battery is described which includes an improved positive electrode. Such an electrode comprises a supporting base of an electrically conductive material inert to corrosion in sulfuric acid, a non-polarizing layer adhering to the surface of the supporting base, an electrodeposited layer of chemically inert beta-lead dioxide adhering to the surface of the non-polarizing layer, and a layer of chemically active lead dioxide adhering to the electrodeposited beta-lead dioxide layer.

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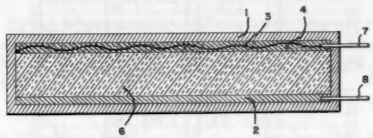
3,819,415

## THERMAL REACTION BATTERY

**Asaf A. Benderly, 9915 Logan Dr., Potomac, Md. 20854, and Donald R. Hartter, 1701 E. West Hwy., Silver Spring, Md. 20910**

**Continuation of Ser. No. 541,861, April 11, 1966, abandoned. This application Apr. 9, 1970, Ser. No. 24,430**
**Int. Cl. H01m** *21/14*
**U.S. Cl. 136—83 T** **6 Claims**




An improved thermal reaction battery consisting of a cathode, an anode and a precursor in contact with the electrodes, wherein the precursor is a non-conductive solid at ambient temperatures chemically reactive on thermal activation to form a permanently liquid electrolyte.

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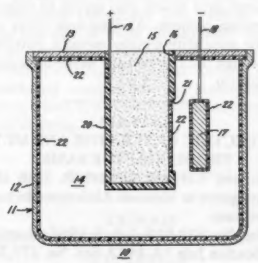
3,819,416

## ELECTROCHEMICAL CELL WITH INSIDE LAYER OF WATER-SWELLABLE POLYMER

**Willard T. Grubb, Schenectady, N.Y., and Carl E. Cliche, Peabody, Mass., assignors to General Electric Company, Schenectady, N.Y.**

**Division of Ser. No. 725,989, May 2, 1968, Pat. No. 3,629,008. This application June 15, 1970, Ser. No. 57,423**
**Int. Cl. H01m** *27/02*
**U.S. Cl. 136—86 R** **1 Claim**




A composite gas diffusion electrode has an electrode body, at least one water soluble polymeric thickening or gelling agent swellable in an aqueous electrolyte, and a layer of the thickening agent adhering to and covering at least a portion of one of the surfaces of the electrode body. Upon subsequent use in contact with an aqueous electrolyte, the thickening agent swells on the covered surface of the electrode body preventing electrolyte leakage therethrough, preventing drowning of the electrode, reducing loss of any dissolved fuel in the electrolyte, and immobilizing at least partially the electrolyte. Additionally, an electrochemical cell with at least one gas diffusion electrode has the above type of thickening agent covering various portions of the interior structure of the cell.

Upon subsequent use in contact with an aqueous electrolyte, the thickening agent swells on covered portions of the interior structure preventing electrolyte leakage therethrough, and immobilizing at least partially the electrolyte.

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3,819,417

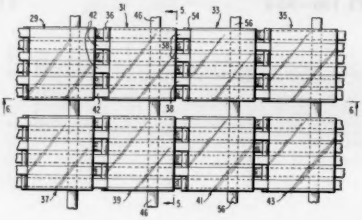
## MECHANICALLY INTERLACED AND ELECTRICALLY INTERCONNECTED SILICON SOLAR CELLS

**Joseph G. Haynos, Rockville, Md., assignor to Communications Satellite Corporation, Washington, D.C.**

**Filed May 17, 1972, Ser. No. 254,120**

**Int. Cl. H01l** *15/02*

**U.S. Cl. 136—89** **9 Claims**



In an assembly of solar cells the individual cells are arranged in a matrix of rows and columns. The cells in each row are electrically serially interconnected, with parallel electrical connections being made between all cells in a common column. A plastic strip with a metallic pattern, such as thin lines or diamond shaped pattern, on one surface thereof is woven in an interlaced manner over and under the cells in a common row. The metallic pattern extends from the top surface of a cell which the plastic strip overlays to the bottom surface of the preceeding adjacent cell which the strip passes under. The metallic pattern is on a single surface of the plastic strip facing downward and is either directly connected to the top surface of the cells or connected to an electrode bar on the edge of the top surface of the cells. The bottom surface of the cells is connected to the metallic pattern adjacent thereto by means of a metal strip which also serves to interconnect the cells in a common column. At least one other substantially identical plastic strip with similar metallic pattern thereon is interwoven through the row of cells in the opposite manner to the first plastic strip.

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3,819,418

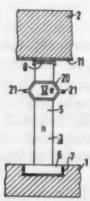
## THERMOELECTRIC GENERATOR AND METHOD OF PRODUCING THE SAME

**Josef Winkler, and Gerhard Oesterhelt, both of Nurnberg, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany**

**Division of Ser. No. 839,910, July 8, 1969, abandoned. This application July 13, 1972, Ser. No. 271,241**

**Int. Cl. H01v** *1/32*

**U.S. Cl. 136—205** **3 Claims**



Thermoelectric generator including a thermocouple with a p-type leg and an n-type leg having respective adjacent cold ends and hot ends, contact bridges attached to the legs at both ends thereof and connecting the legs to one another at one end thereof, heat exchangers respectively connected to the contact bridges at the cold and hot ends of the legs, each of the legs having two segments formed of different thermoelectrically effective materials, and electrically and thermally conductive connecting means connected to the segments of each of the legs and having at least two components one of which is flexible, the components being metallurgically bonded respectively to each of the segments and connected to one another; and method of producing the same.

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3,819,419

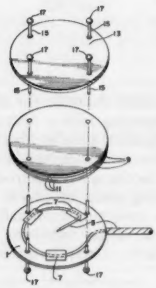
## STEADY STATE THERMAL RADIOMETERS

**Jack D. Loose, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.**

**Filed Nov. 17, 1972, Ser. No. 307,728**

**Int. Cl. H01v** *1/02*

**U.S. Cl. 136—213** **12 Claims**



A radiometer operative in a vacuum under steady-state conditions. The front element is an aluminum sheet painted on the outer side with black or other absorptive material of selected characteristics. A thermocouple is bonded to the inner side of the aluminum sheet. That is backed by highly insulative layers of glass fiber and crinkled, aluminized Mylar polyester. Those layers are backed with a sturdy, polyester sheet, and the entire lamination is laced together by nylon cords. The device is effective for the purposes designed, is highly reliable in that it does not drift out of calibration, and is significantly inexpensive.

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3,819,420

## SMALL AXIAL THERMOCOUPLE

**Hans Schmidt; Erwin Eggert, and Gert Shuckle, all of Leopoldshafen, Germany, assignors to Gesellschaft fur Kernforschung GmbH, Karlsruhe, Germany**

**Filed Sept. 24, 1971, Ser. No. 183,344**

**Claims priority, application Germany, Sept. 26, 1970, 2047539**

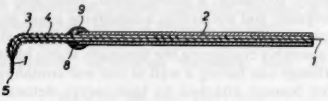
**Int. Cl. H01v** *1/02*

**U.S. Cl. 136—228** **10 Claims**

A thermocouple having a cut Taylor which constitutes one leg of the thermocouple. The Taylor wire is coaxially sealed in a glass capillary tube. A metal tube at least partly coaxially encloses the glass capillary tube and constitutes the lead of the

other thermoelectric leg. The metal core of the Taylor wire is made of one thermocouple material which is connected with the metal tube by an at least barely electrically conducting layer of the other thermoelectric material, thus constituting the thermoelectrically active measurement junction at the point of contact between the metal core and the layer.

In practice, the glass capillary tube with the Taylor wire coaxially sealed in it may be bent by 90° in the region outside the metal tube.




The above-described thermocouple is made as follows. After the Taylor wire has been sealed in the glass capillary tube, it is bent together with the latter and cut off only afterwards, thus exposing the metal core. The glass capillary tube is sealed in the metal tube. Subsequently, both the thermoelectric measurement junction proper and, at the same time, the connecting lead with the metal tube is made between the metal tube and the front faces of the metal core, by precipitating a thin metal layer of the proper material.

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**3,819,421**

## METHOD FOR THE MANUFACTURE OF DISLOCATION-FREE, SINGLEnCRYSTAL GALLIUM ARSENIDE ROD

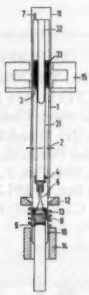
**Hans Merkel, and Hans-Jochen Wolf, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany**

**Filed Feb. 22, 1973, Ser. No. 334,935**

**Claims priority, application Germany, Mar. 1, 1972, 2209869**

**Int. Cl. B01j *17/16***

**U.S. Cl. 148—1.6** **7 Claims**



An improved method for drawing dislocation-free, single crystal gallium arsenide rods in which the drawing vessel is filled with an inert gas of a preselected conductivity at a predetermined pressure, additional arsenic is added to maintain a desired partial pressure, and the melt temperature is controlled to initially draw a "narrow-neck" and then decreased until a crystal of the desired diameter is being drawn. The initial drawing of the narrow neck causes the dislocations to travel in the direction of their growth and disappear, after which a crystal of the desired diameter with dislocations may be drawn.

**3,819,422**

## METHOD FOR APPLYING ZINC PHOSPHATE COATINGS TO METAL SURFACES

**George Schneider, Trevose, Pa., assignor to Amchem Products, Inc., Ambler, Pa.**

**Filed Dec. 28, 1971, Ser. No. 213,203**

**Int. Cl. C23f *9/02***

**U.S. Cl. 148—6.152** **9 Claims**

Zinc and zinc/calcium phosphate coatings of excellent quality can be formed on ferriferous and zinciferous surfaces without an intermediate water rinse between alkaline cleaning and phosphating if cleaners containing polyphosphates or sequestrants are avoided and the soil content of the cleaner bath is maintained below about 5g/1.

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**3,819,423**

## FINAL RINSE STEP IN PHOSPHATING OF METALS

**Harry R. Charles, Troy, and Donald L. Miles, Bloomfield Hills, both of Mich., assignors to Chemfil Miles Chemical & Filter Co., Inc., Troy, Mich.**

**Filed June 15, 1972, Ser. No. 263,004**

**Int. Cl. C23f *7/10***

**U.S. Cl. 148—6.15 R** **6 Claims**

Finally rinsing a phosphated metal surface with a molybdenum type rinse, such as a dilute aqueous solution of molybdenum oxide and an inorganic acid, preferably nitric acid, and which may also include ammonia.

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**3,819,424**

## METHOD AND COMPOSITION FOR TREATING METAL SURFACES

**William S. Russell, Warren, and Gary A. Reghi, Detroit, both of Mich., assignors to Oxy Metal Finishing Corporation, Warren, Mich.**

**Continuation-in-part of Ser. No. 154,156, June 17, 1971, abandoned. This application Dec. 11, 1972, Ser. No. 314,077**

**Int. Cl. C23f *7/10, 7/14***

**U.S. Cl. 148—6.15 R** **10 Claims**

The disclosed composition and method are useful for imparting corrosion resistance to metal surfaces. Predominately iron, aluminum or zinc surfaces are treated with an aqueous solution comprising phosphate ions, simple fluoride ions, chlorate ions and one or more Group VIIIb metal cations in specified concentrations. The composition contains essentially no bromate or "coating-metal" cation. Metals treated with the disclosed composition are particularly suited for treating metals which are to be subsequently painted and subjected to cold forming.

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**3,819,425**

## COMPOSITE COATING ADHERENT UNDER SHEAR CONDITION

**Jon A. De Ridder, Ashtabula, and Alexander W. Kennedy, Chardon, both of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio**

**Filed Oct. 18, 1972, Ser. No. 298,795**

**Int. Cl. C23c *1/10*; C23f *7/00***

**U.S. Cl. 148—6.16** **22 Claims**

Composite coatings, applied on metal substrates, maintain excellent adhesion when subjected to shearing forces such as encountered in metal stamping. This adhesion is obtained through first observing careful control over size distribution of particles associated with both the undercoating and the topcoating. Next control is exercised over comparative particle size selection for the undercoating versus the topcoating. Further, maintenance of other composite coating characteristics, e.g., corrosion resistance and impact adhesion, is stressed.

3,819,426

## PROCESS FOR PRODUCING NON-SILICON BEARING ELECTRICAL STEEL

David P. Decaro, and Gerald A. Gronceski, both of Michigan City, Ind., assignors to National Steel Corporation, Pittsburgh, Pa.

Filed July 31, 1972, Ser. No. 276,325
Int. Cl. H01f 1/00
U.S. Cl. 148—120 4 Claims

Non-silicon bearing electrical steel is produced utilizing steel from a basic oxygen furnace or open hearth with particular ranges of carbon and oxygen and degassing to reduce the levels of these constituents. The degassed material is formed into slabs, hot rolled, pickled, cold rolled and can be finished, annealed and used. Preferably the cold rolled product is annealed and subjected to cold working before use. By utilizing a particular degree of cold working subsequent to cold rolling and annealing significantly enhanced electrical properties are obtained compared to where there is no cold working or a lesser amount of cold working. Manganese and phosphorus may be added to improve both mechanical and electrical properties.

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3,819,427

## METHOD OF MAKING AN ELECTROMAGNETIC-SHEET STACK

Viktor Baesch, Essen, Germany, assignor to Ludwig-Ofag-Indugas Industrieanlagen GmbH, Essen, Germany

Filed June 21, 1972, Ser. No. 264,797
Claims priority, application Germany, Sept. 11, 1971, 2145553
Int. Cl. H01f 1/00
U.S. Cl. 148—122 1 Claim

A plurality of identical ferromagnetic sheets are stamped or punched from a larger sheet of silicon-alloy steel. A finely divided powder of an inert bond inhibitor and spacer is mixed with the oil applied to the sheets during the stamping operation, or is applied to the sheets before or after stamping. The coated sheets are thereafter stacked and fastened together and heated to a temperature sufficient to anneal them and to form an insulating oxide layer on the sheets.

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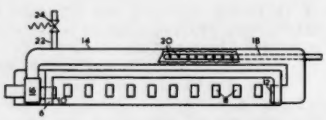
3,819,428

## METAL TREATMENT

Colin Moore, 9 Chellow Dene, Bradford, England

Filed Apr. 21, 1972, Ser. No. 246,189
Claims priority, application Great Britain, Apr. 22, 1971, 10734/71; Jan. 18, 1972, 2352/72
Int. Cl. C21d 1/62
U.S. Cl. 148—125 14 Claims



A metal hardening process including a cooling of the metal to a temperature in the range −80° to −120°C prior to tempering. The cooling is preferably effected in a liquid bath cooled by a liquefied gas.

3,819,429

## BLASTING AGENT FOR BLASTING IN HOT BOREHOLES

William E. Schaefer, Hagerstown, Md., assignor to E.I. du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 24, 1973, Ser. No. 326,378
Int. Cl. C06b 1/04
U.S. Cl. 149—21 9 Claims

A blasting agent resistant to decomposition when exposed to elevated temperatures, e.g., 325° – 350° F. for 24 hours, comprises an inorganic oxidizing salt such as ammonium nitrate; a high-boiling liquid oxygen-containing organic fuel, e.g., dibutyl phthalate; a gelling agent, preferably an acrylamide polymer; and preferably a densifying agent such as ferrophosphorus and a coating agent such as calcium stearate. A primer assembly containing the thermally stable blasting agent in a cartridge can having a well at one end containing a high-explosive booster attached to high-energy detonating cord, which is in initiating relationship with a blasting cap. The metal-cartridged blasting agent and primer assembly are useful for blasting in hot boreholes, which can be either wet or dry.

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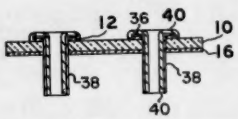
3,819,430

## METHOD OF MANUFACTURING CIRCUIT BOARD CONNECTORS

William P. Dugan, Ontario, Calif., assignor to General Dynamics Corporation, Pomona, Calif.

Filed Feb. 5, 1973, Ser. No. 329,798
Int. Cl. C23f 1/02
U.S. Cl. 156—3 39 Claims




Disclosed is a method of manufacturing a "unitube" circuit board, that is, a single or multi-layer circuit board having a plurality of tubes, in continuity with the circuit or circuits, projecting from the board for the connection of electronic component leads.

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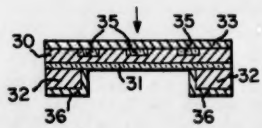
3,819,431

## METHOD OF MAKING TRANSDUCERS EMPLOYING INTEGRAL PROTECTIVE COATINGS AND SUPPORTS

Anthony D. Kurtz, Englewood; Charles L. Gravel, Riveredget, and Joseph R. Hallon, Jr., Wood-Ridge, all of N.J., assignors to Kulite Semiconductor Products, Inc., Ridgefield, N.J.

Division of Ser. No. 186,694, Oct. 5, 1971, Pat. No. 3,753,196.
This application Dec. 7, 1972, Ser. No. 311,724
Int. Cl. C23f 1/02; C23b 3/04
U.S. Cl. 156—7 4 Claims




There is disclosed a force transducer fabricated from silicon and having the appearance of an annular disk. Disposed on one surface of said disk are one or more piezoresistive elements which respond to a force applied to a diaphragm portion of said disk which is surrounded by the wall formed by the

annular ring. The disk is mounted in a housing with the piezoresistive elements facing away from the applied force surface; this surface of the diaphragm and ring has formed thereon a thin layer of silicon dioxide which serves to protect the disk against deleterious agents present in the force transmitting environment while further serving to eliminate an undesirable bimetallic effect.

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**3,819,432**

**METHOD OF PRODUCING SCHOTTKY CONTACTS**

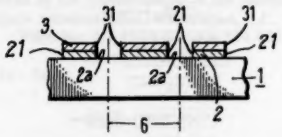
**Hermann Kniepkamp, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany**

**Filed Nov. 22, 1971, Ser. No. 200,900**

**Claims priority, application Germany, Nov. 20, 1970, 2057204**

**Int. Cl. C23f** *1/02*; **H01l** *7/50*

**U.S. Cl. 156—11** **1 Claim**




Method of producing metal-semiconductor contacts (Schottky contacts) with precisely defined and preferably relatively small areas by uniformly coating a semiconductor surface with a layer of chromium, coating a layer of aluminum in a pattern corresponding to the desired contacts onto the chromium layer and etching the uncoated chromium layer areas with hydrochloric acid having a concentration of at least about 1 percent until corresponding areas of the semiconductor surface are exposed. The so-formed plurality of contacts on a semiconductor sample can be divided into individual components each having at least one such contact. Connection wires or the like are attachable directly to the aluminum area by thermo-compression or ultra-sonic bonding.

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**3,819,433**

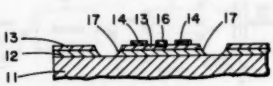
**FABRICATION OF SEMICONDUCTOR DEVICES**

**Ronald R. Bowman, Phoenix, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.**

**Division of Ser. No. 55,579, July 16, 1970, Pat. No. 3,709,695. This application May 18, 1972, Ser. No. 254,759**

**Int. Cl. C23f** *1/02*

**U.S. Cl. 156—13** **2 Claims**




A germanium mesa transistor is fabricated having an epitaxially grown base region and an aluminum alloy emitter in the epitaxially grown layer spaced from the collector junction, and having a gold-comprising base electrode surrounding the emitter and closely spaced therefrom. The gold contact is formed by photolithographic and selective etching techniques, followed by the formation of the aluminum emitter, which is also formed by photolithographic and selective etching techniques. A key step is the selective removal of the aluminum from the germanium wafer without disturbing the gold contact.

**3,819,434**

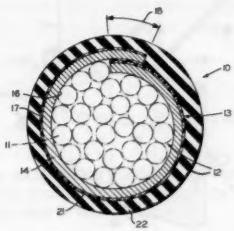
**METHODS OF MAKING COMMUNICATIONS CABLES WITH SEALED METALLIC MOISTURE BARRIERS**

**Matthew R. Dembiak, Clifton, N.J., and George H. Webster, Timonium, Md., assignors to Western Electric Company, Incorporated, New York, N.Y., by said Matthew R. Dembiak and Bell Telephone Laboratories, Incorporated, Murray Hills, N.J., by said George H. Webster**

**Division of Ser. No. 125,362, March 17, 1971, Pat. No. 3,703,605, which is a continuation-in-part of Ser. No. 809,589, March 24, 1969, abandoned. This application May 22, 1972, Ser. No. 255,582**

**Int. Cl. H01b** *13/06, 13/26*

**U.S. Cl. 156—54** **10 Claims**




Successive portions of an aluminum tape having one major surface thereof coated with an adhesive copolymer across the entire transverse width thereof and the other major surface precoated with a stripe of adhesive material along an edge portion are folded longitudinally about successive sections of a cable core which are being advanced along a predetermined path to form an overlapped seam so that the adhesive copolymer on an edge portion of the one major surface of the tape overlaps the stripe. Subsequently, the adhesive materials on the major surfaces along the overlapped seam develop an adhesive bond by the application of heat and pressure prior to or during the extrusion of a plastic jacket over the tape. The adhesive material on the other, now inwardly facing, major surface is substantially restricted in location and is adhesively bonded to the portion of the inwardly facing major surface of the tape which forms the overlapped seam with a portion of the one, now outwardly facing major surface. The remaining portion of the inwardly facing major surface of the aluminum tape is bare and facilitates grounding the cable at a splice location.

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**3,819,435**

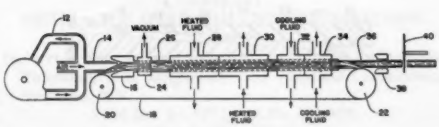
**PROCESS FOR MAKING CIGARETTE FILTERS FROM SHORT SYNTHETIC FIBERS**

**John D. Roberts; John D. Ellenberg, and Charles M. Keith, all of Charlotte, N.C., assignors to Celanese Corporation, New York, N.Y.**

**Division of Ser. No. 775,390, Nov. 13, 1968, Pat. No. 3,656,484. This application Feb. 7, 1972, Ser. No. 224,004**

**Int. Cl. B32b** *5/08, 5/16*

**U.S. Cl. 156—62.2** **10 Claims**




Aerosol filters, particularly cigarette filters, are formed from short synthetic fibers containing a bonding agent by con-

fining a random array of said fibers having an orientation predominantly transverse to the longitudinal axis of said filter in an area having the desired configuration and activating the bonding agent to form a coherent article.

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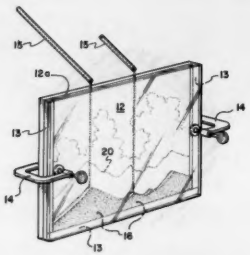
**3,819,436**

## METHOD OF PRODUCING A SAND PAINTING

**Philo H. Allen, Taylorsville, Utah, assignor to Sand Arts Incorporated, Salt Lake City, Utah**

**Filed May 15, 1972, Ser. No. 253,247**
**Int. Cl. B44c** *1/06*
**U.S. Cl. 156—63** **9 Claims**




A sand painting and a method of creating an attractive and decorative permanent painting from colored sands involving: releasibly attaching a spacer and a sealer strip mounting a transparent panel thereon around three peripheral edges of a face of a backing board coated with a dried, soluble adhesive; erecting the connected spacer and sealer strip and backing board such that an opening into the space between the backing board and the transparent panel is at the top end of the assembly; pouring patterns of natural sands or sands that have been colored by application of a pigment and sealant mixture thereto through the opening to form a desired pattern or design between the backing board and transparent panel; laying the backing board flat; removing the sealer and spacer strip and transparent panel therefrom; spraying the sand picture with a clear solvent solution that will percolate through the sand grains to soften the adhesive with which the backing board has been coated and which thereafter re-hardens to bind the sand grains thereto; and spraying a clear bonding agent mixture over the entire picture that adheres to the sand grains making the picture waterproof and permanent.

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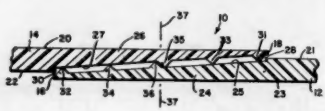
**3,819,437**

## SONIC WELDING

**Ellis Howard Paine, Woodstock, Conn., assignor to Moldex, Inc., Wauregan, Conn.**

**Division of Ser. No. 57,499, July 23, 1970, abandoned. This application Aug. 31, 1972, Ser. No. 285,450**
**Int. Cl. B32b** *31/26*
**U.S. Cl. 156—73** **6 Claims**




A joint construction formed by sonically welding the edges of sheets of oriented nylon. The coextensive edge portions of the nylon sheets are formed with generally complementary surfaces which are at an acute angle to the flat surfaces. A plurality of ridge portions extend from the complementary surfaces substantially parallel to the adjacent edges and concentrate sonic energy introduced into the joint at the interface of the complementary surfaces to form a weld joining the sheets, with the thickness of the completed joint being substantially the same thickness as an individual sheet.

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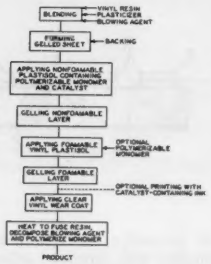
**3,819,438**

## METHOD FOR PREPARING DIMENSIONALLY STABLE PLASTIC SURFACE COVERINGS

**Jack H. Witman, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.**

**Filed June 27, 1972, Ser. No. 266,585**
**Int. Cl. B32b** *5/18, 31/14*
**U.S. Cl. 156—79** **7 Claims**




A flexible, dimensionally stable plastic surface covering having a non-foamed poly(vinyl chloride) layer containing cross-linked polymer positioned between two foamed poly(vinyl chloride) layers, and having a wear resistant top coat on the surface of the system. One or more of the foamed surfaces may be embossed, and the top foamed surface may carry a printed decoration thereon.

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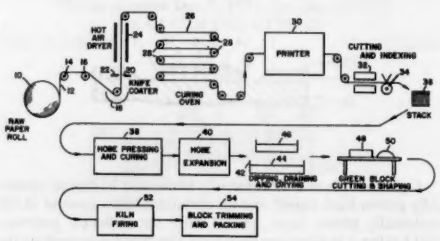
**3,819,439**

## METHOD OF MAKING HONEYCOMB OF SINTERABLE MATERIAL EMPLOYING STEPWISE COATING OF A RESIN-CONTAINING COMPOSITION

**Robert S. Taylor, Livermore, Calif., assignor to Hexcel Corporation, Dublin, Calif.**

**Continuation-in-part of Ser. No. 144,113, May 17, 1971, abandoned. This application Oct. 5, 1972, Ser. No. 295,333**
**Int. Cl. C04b** *39/12;* **B32b** *3/12*
**U.S. Cl. 156—89** **18 Claims**




Sinterable materials are employed in preparing regular honeycomb structures by preparing a sheet of a sinterable material and a resin binder, normally by coating a porous carrier with a light first coating of a composition containing a sin-

terable material and a resin binder. Node bonds are printed onto the sheet and the sheets are then stacked with the node bonds in appropriate spatial relationship. The stack is cured and the sheets are expanded in a warm aqueous environment to provide a green stock of honeycomb structure. The green stock is coated with additional coats of sinterable material and resin binder. The resulting honeycomb structure is then fired to provide a stable, highly uniform, expanded honeycomb structure of excellent strength and uniformity.

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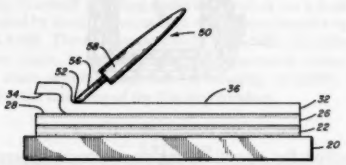
**3,819,440**

## TECHNIQUE FOR RECOVERY OF VOICE DATA FROM HEAT DAMAGED MAGNETIC TAPE

**Joe F. Melugin, La Porte, and David E. O'Brien, III, Houston, both of Tex., assignors to The United States of America as represented by the Administrator of the National Aeronautics of Space Administration, Washington, D.C.**

**Filed Jan. 16, 1973, Ser. No. 324,029**
**Int. Cl. B32b** *35/00*
**U.S. Cl. 156—94** **2 Claims**




A method for conditioning, and thus enabling retrieval of intelligence from, magnetic tapes after damage from heat has caused the tape to wrinkle and curl severely thereby reducing tape width to less than one-half its original size. The damaged tape is superposed on a first piece of splicing tape with the oxide side of the magnetic tape in contact with the adhesive side of the splicing tape and then carefully smoothed by a special tool. A second piece of splicing tape is placed on the backing side of the magnetic tape then the resulting tape stack is trimmed to the original width of the magnetic tape. After the first piece of splicing tape is carefully removed from the oxide side of the damaged magnetic tape, the resulting magnetic tape is then ready to be placed into a recorder for playback.

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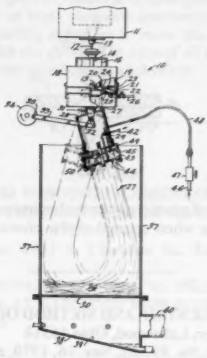
**3,819,441**

## PROCESS FOR MAKING GLASS FIBER PRODUCT USING PHENOLIC BINDER RESINS

**Harland E. Fargo, and Clayton A. Smucker, both of Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio**

**Filed July 5, 1972, Ser. No. 268,984**
**Int. Cl. B32b** *17/04;* **C03c** *27/10*
**U.S. Cl. 156—167** **2 Claims**

An improved method is disclosed for effecting environmental control in the production of a binder-coated fiber and fiber products. Heat-softened material is attenuated into fibers, cooled to a maximum temperature of about 350°F., coated with a binding agent, collected on a suitable conveyor, and heated in an oven to cure the binder. The binding agent is a phenol-aldehyde type resin which has been condensed to an



advanced stage such that the condensate is water-insoluble at a pH of 7.5. The condensate is solubilized by adding a small amount of a non-ionic or anionic agent.

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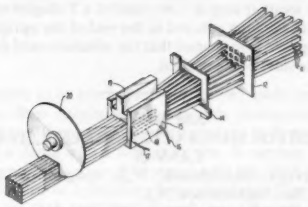
**3,819,442**

## ALIGNMENT TECHNIQUES FOR FIBER BUNDLES

**Anatoli Brushenko, Elmhurst, Ill., assignor to The United States of America as represented by the Secretary, Department of Health Education and Welfare, Washington, D.C.**

**Filed Apr. 4, 1972, Ser. No. 241,008**
**Int. Cl. G02b** *5/14*
**U.S. Cl. 156—180** **8 Claims**



An alignment technique for fiber bundles using a multiple square orifice which involves threading plastic or glass fibers from multiple spools through a convergent multiple orifice made of converging glass tubes or a metal grid perforated with square or rectangular holes. The aligned bundle is then passed through a sizing aperture and either binder is applied or the fibers are fused together at predetermined intervals therealong. The aligned bundles may then be cut to the desired length.

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**3,819,443**

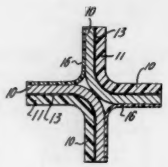
## METHOD FOR MAKING MULTIFINNED SHIELDING TAPES

**Herbert D. Simons, Long Valley, N.J., and Frank E. Timmons, Richmond, Ind., assignors to Sun Chemical Corporation, New York, N.Y.**

**Filed Jan. 15, 1973, Ser. No. 323,950**
**Int. Cl. B29c** *27/14*
**U.S. Cl. 156—204** **4 Claims**

A method for forming longitudinal multifinned tapes by laminating a metal foil to a plastic film and then folding the laminate lengthwise plastic-to-plastic which is then placed

fold-to-fold against another or plurality of same type folded laminates. A plastic film is then laminated across both surfaces



of the plurality of plastic-to-plastic laminates with a resulting multifinned tape when opened at the plastic-to-plastic interfaces.

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3,819,444

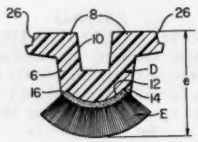
## WEATHER STRIP AND METHOD OF MAKING

Aaron J. Ungerer, Lakewood, Ohio 44314

Division of Ser. No. 89,582, Nov. 16, 1970, abandoned. This application Sept. 25, 1972, Ser. No. 292,080

Int. Cl. B32b *31/18*

U.S. Cl. 156—250 7 Claims



A flocked weather strip for insertion into a T-shaped recess of a door or door frame for engagement with the other upon closing. The weather strip is comprised of a T-shaped member of plastic with flocking adhered to the end of the upright. The end of the upright is so shaped that the adhesive used does not flow onto the sides of the upright.

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3,819,445

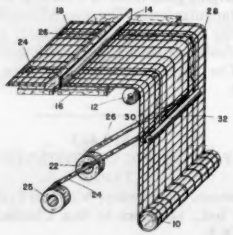
## PROCESS FOR MANUFACTURING NEEDLEPOINT CANVAS

Roy F. Devries, Saddlebrook, N.J., assignor to DeVries Brothers, Inc., Saddlebrook, N.J.

Filed July 13, 1972, Ser. No. 271,416

Int. Cl. B32b *31/14*

U.S. Cl. 156—277 8 Claims



A process for manufacturing needlepoint canvas by utilizing high speed printing equipment comprising placing an air impervious backing on selective parts of the canvas so that the canvas sheets can be fed at high speeds by a vacuum sucker-type feeding arrangement, and then applying a coating which makes the surface of the canvas receptive to colored hnks or paints used in the printing process. For example, clear printing ink or over-print varnish is printed on the canvas to prevent sizing in the canvas from injuring the printing plates during printing. Then the needlepoint canvas has the color design applied thereon utilizing lithographic, letter press or rubber plate equipment. After printing, the air impervious backing sheet or strip is removed and the canvas is trimmed to the desired size.

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3,819,446

## METHOD FOR MANUFACTURING ELECTRICAL APPARATUS

Takashi Suzuki, Toyonaka, and Koichi Hirakawa, Kawanishi, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 855,087, Sept. 4, 1969, abandoned. This application Dec. 28, 1970, Ser. No. 102,188

Int. Cl. B32b *7/14*; B44d *1/52*

U.S. Cl. 156—291 1 Claim

A method for manufacturing an electrical apparatus in which plate electric conductors on one or both surfaces of each of which an electrically insulating synthetic resin compound is localized in the form of dots, lines or mesh are superposed so that the insulation distance between said conductors is maintained by said localized synthetic resin, and a thixotropic thermo-setting resin solution is used as the insulating synthetic resin compound for being localized on the surfaces of said plate conductors by the intaglio printing or the silk-screen printing.

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3,819,447

## PROCESS FOR GLUING SOLID MATERIALS

Horst Dalibor, Hamburg-Harksheide; Richard Gutte, Oststeinbek, and Gunter Stenzel, Hamburg, all of Germany, assignors to Reichhold-Albert-Chemie Aktiengesellschaft, Hamburg, Germany

Filed June 5, 1972, Ser. No. 259,457

Claims priority, application Switzerland, June 7, 1971, 8268/71

Int. Cl. C09j *5/00*; C08f *15/40, 15/38*

U.S. Cl. 156—330 7 Claims

The invention relates to a process for gluing solid materials with hot-melt adhesives based on reaction products of copolymers of esters of unsaturated acids with polyepoxide compounds. The copolymer employed is a reaction product of nitriles of $\alpha,\beta$-ethylenically unsaturated monocarboxylic or dicarboxylic acids, amides of $\alpha,\beta$-ethylenically unsaturated monocarboxylic or dicarboxylic acids, esters of $\alpha,\beta$-ethylenically unsaturated monocarboxylic or dicarboxylic acids, containing four to 12 carbon atoms in the alcohol radical and methyl methacrylate.

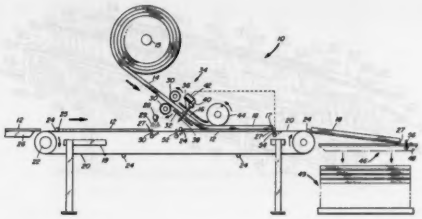
The adhesive bonds prepared according to this invention show considerably improved heat stability, better shear strength and peel strength.

3,819,448

## AUTOMATIC SHEET LINING MACHINE

Albert Beever, III, 17 Scottsdale Ct., Lutherville, Md. 21093

Filed Apr. 11, 1972, Ser. No. 243,034
Int. Cl. B26d 5/00; B32b 31/00
U.S. Cl. 156—355 9 Claims



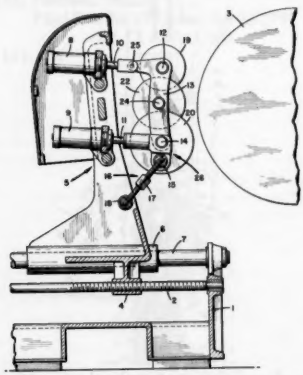
A new and improved automatic machine, designed to bond together flat sheets of metal and insulating or sound proofing material is provided. The machine is comprised of a flat bed frame and has a continuous conveyor arrangement which feeds the metal sheets, first under an adhesive spray, then under the insulating or sound proofing material sheets. The insulating or sound proofing material which is on a bulk roll is channeled by feed rollers and cut into proper lengths by a controlled knife. The two sandwiched sheets, with the adhesive in between them, is passed under a compression roller which bonds them securely together. A stacking assembly is provided for the handling of the finished product.

3,819,449

## STITCHING APPARATUS FOR TIRE BUILDING MACHINES AND RELATIVE STITCHING METHOD

Renato Caretta, Varese, Italy, assignor to Industrie Pirelli S.p.A., Milano, Italy

Filed Sept. 8, 1972, Ser. No. 287,491
Claims priority, application Italy, Sept. 23, 1971, 28974/71
Int. Cl. B29h 17/02, 17/08, 17/18
U.S. Cl. 156—413 6 Claims



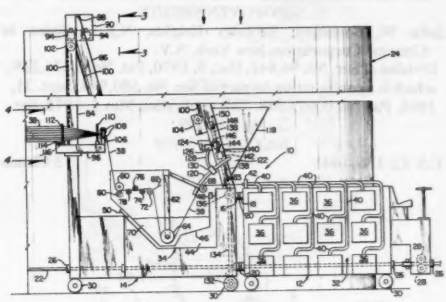
A method and apparatus for stitching the carcass of a pneumatic tire rotating on a building drum which comprises stitching the carcass band situated astride the middle plane with a first roller and thereafter successively stitching outwardly from said middle plane with a plurality of pairs of rollers. The apparatus to perform the method comprises a base on which is supported a frame movable toward and away from the building drum. The frame supports a first roller positioned to control the carcass on the drum at the middle plane thereof and a plurality of pairs of rollers arranged symmetrically to the drum line, a pair of lever elements interconnecting all rollers and two double-acting cylinders to move the rollers into and out of contact with the drum. The axes of all rollers are parallel to the axes of the drum and to each other.

3,819,450

## APPARATUS FOR WINDING FILAMENTARY MATERIAL AROUND THE PERIPHERY OF AN UPRIGHT STRUCTURE

Bernard P. Kunz, 4981 S. Clarkson St., Englewood, Colo. 80110

Filed Oct. 26, 1971, Ser. No. 192,539
Int. Cl. B31c 13/00; B65h 81/00
U.S. Cl. 156—425 4 Claims



Structure to be reinforced is preferably made up of sections of glass fiber reinforced plastic resin honeycomb paneling bonded together at their abutting edges to form an upright wall or a dome with a wall at its rim. A carriage adapted to travel repeatedly around the structure is provided with storage means for one or a plurality of strands of glass fiber roving and with a dip tank containing liquid resin. Strands move from storage means to dip tank and are impregnated by immersion or by contact with a coating roller and then pass to an applicator. In the case of multiple strands the applicator includes a comb to guide the strands in generally planar spaced relation and tilt the plane toward vertical to apply strands in a wide band to the wall. Travel of the carriage pulls the strands into place under tension, and gradually rising applicator applies strands in a spiral path. The catalyzed resin cures in situ to cohesively bond strands to wall and produce an integral structure.

3,819,451

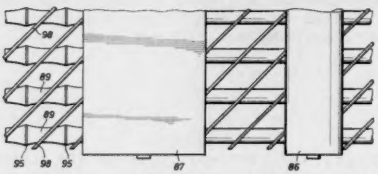
## APPARATUS FOR MAKING INFLATED PLASTIC MESH

Alan W. Nalle, 108 West 2nd St., Austin, Tex. 78701

Division of Ser. No. 814,550, April 9, 1969, abandoned. This application Dec. 20, 1971, Ser. No. 210,185
Int. Cl. B29b 27/02
U.S. Cl. 156—433 16 Claims

Apparatus for forming an inflated mesh comprising two relatively rotatable dies, a set of extrusion orifices in each of

said dies for extruding filaments, gas pressure means in at least one of said set of extrusion orifices for inflating said filaments



and heat sealing means to cause said filaments to become bonded to form an inflated plastic mesh product.

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**3,819,452**

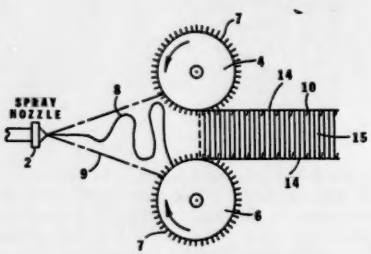
**APPARATUS FOR THE PRODUCTION OF SPRAY SPUN NONWOVEN SHEETS**

**John W. Soehngen, Berkeley Heights, N.J., assignor to Celanese Corporation, New York, N.Y.**

**Division of Ser. No. 96,041, Dec. 8, 1970, Pat. No. 3,676,239, which is a continuation-in-part of Ser. No. 580,994, Sept. 21, 1966, Pat. No. 3,607,588. This application May 1, 1972, Ser. No. 249,299**

**Int. Cl. B29c** *13/00*

**U.S. Cl. 156—441** **5 Claims**




Apparatus for making fibrous products comprising nozzle means for spray spinning filamentary material, an opposed pair of spaced apart collection having a series of spaced projections on their respective surfaces, means for driving said collectors and means for producing back and forth relative movement between said nozzle means and said collectors.

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**3,819,453**

**APPARATUS FOR CORRUGATING A WEB OF THIN MATERIAL SUCH AS PAPER, IN A CONTINUOUS PROCESS**

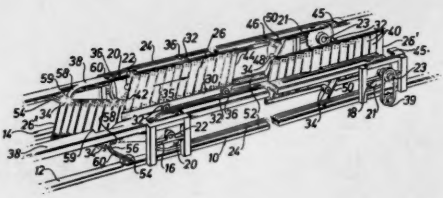
**Per Gunnar Norback, Lidingo, Sweden, assignor to Aktiebolaget Carl Munters, Sollentuna, Sweden**

**Filed May 30, 1972, Ser. No. 257,841**

**Int. Cl. B31f** *1/00*

**U.S. Cl. 156—459** **4 Claims**

Apparatus for diagonally corrugating a web of thin deformable material in a continuous process in which the web is fed into the apparatus which comprises a molding head and a molding table constituted by plates arranged in a series and movable along a closed path, each plate being formed with grooves extending obliquely to the direction of advance of the



plates. Each table has two opposite, mutually parallel lateral edges extending in the direction of advance movement of the web and two lateral edges interconnecting the first-mentioned lateral edges and extending in parallel to the grooves formed in the plate.

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**3,819,454**

**STRIP JOINTING APPARATUS**

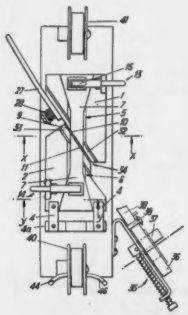
**Peter Arthur Mason, London, England, assignor to International Standard Electric Corporation, New York, N.Y.**

**Filed Nov. 26, 1971, Ser. No. 202,194**

**Claims priority, application Great Britain, Dec. 8, 1970, 58199/70**

**Int. Cl. G03d** *15/04*

**U.S. Cl. 156—505** **4 Claims**



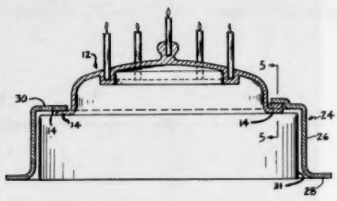
Two ends of paper strip to be spliced are overlapped and aligned in grooves in blocks of a tape jointing machine. The ends are clamped in position over a fixed cutting edge. A pivotable cutting edge then cuts the strips. An adhesive tape is then applied over the cut edges within another groove aligned with the cutting edge and a roller tool presses the tape to join the ends and cut off waste portions. The device permits continuous operation of paper insulation machines.

3,819,455

## CAKE PROTECTOR AND CANDLE HOLDER

Edith P. MacKendrick, P.O. Box 7345, Upper Darby, Pa. 19101

Filed May 1, 1972, Ser. No. 249,396
Int. Cl. B65b 25/16
U.S. Cl. 161—7 2 Claims




A shield adapted to be placed over a cake, or other food items to make it inaccessible to people and to insects. The shield is also adapted to hold candles which are customarily used in celebrating birthdays, wedding anniversaries, and other memorable occasions.

3,819,456

## INSULATION BOARD FABRICATED FROM REFUSE

Norman W. Enfield, Rt. Box 84, Fountain, Colo. 80817

Continuation of Ser. No. 46,652, June 16, 1970, abandoned.
This application Dec. 26, 1972, Ser. No. 318,638
Int. Cl. B32g 1/10
U.S. Cl. 161—7 5 Claims

A structural insulation board fabricated of treated refuse, and the method of preparing the same, are disclosed. The method includes the steps of shredding or grinding trash and garbage, mixing the same with a slurry of a binder, molding the resulting mixture into sheets of any desired thickness, and drying the sheets.

3,819,457

## ARTIFICIAL CHRISTMAS TREE HAVING ERECTABLE LIMBS

Alan Mottel, Yonkers, N.Y., assignor to Consolidated Novelty Co., Ltd., Paterson, N.J.

Filed Feb. 26, 1973, Ser. No. 337,757
Int. Cl. A47g 33/06
U.S. Cl. 161—14 4 Claims

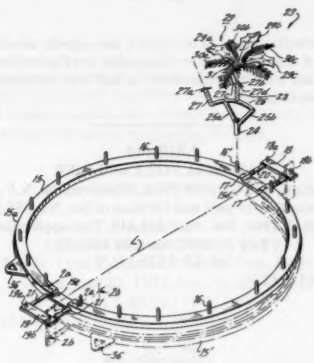
There is disclosed an artificial Christmas tree which includes collapsible struts for facilitating the rapid erection of the tree in a predetermined configuration. In my copending application Ser. No. 254,101, there is disclosed a tree having a number of limbs, each of which includes an elongated hinge section. The limbs are attached at their hinged sections to the upper part of the tree trunk. To this basic configuration there are now added collapsible struts at the bottom of the tree, each strut interconnecting the tree trunk to the free end of a different limb. All that is required to erect the tree is to open all of the struts, the lower free ends of the limbs thus being positioned automatically and secured in place.

3,819,458

## FOLDABLE DECORATIVE STRUCTURE WITH REENFORCING MEMBERS

Abraham S. Kinderman, Philadelphia, and John Kinderman, Newtown Twsp., Newtown Square, both of Pa., assignors to Brite Star Manufacturing Company, Inc., Philadelphia, Pa.

Filed Mar. 16, 1972, Ser. No. 235,243
Int. Cl. A41g 1/00
U.S. Cl. 161—15 6 Claims



A decorative assembly which in the preferred embodiment constitutes a wreath having either real or simulated foliage mechanically joined to a frame or support member which is preferably annular in shape. The nature of the support member is such as to be substantially rigid. Diametrically opposed portions of the support member are of substantially reduced thickness as compared with the remainder of the support member to enable the decorative assembly to be folded in half thereby significantly reducing the volume which the wreath occupies in the stored condition. A pair of bracing members are integrally joined with the support member by means of bendable ribs positioned adjacent the diametric portions of reduced thickness. Cooperating projections and openings are provided as between the support member and the reenforcing members to enable the support members to span each of the reduced thickness portions of the support member and to be force-fittingly joined to the support member causing the decorative assembly to retain its normal shape and to counteract any bending.

3,819,459

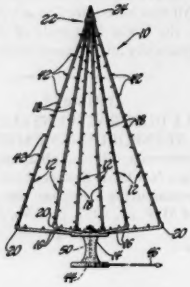
## ASYMMETRIC ARTIFICIAL CHRISTMAS TREE

Boyd R. Wren, 9079 Pinata Way, Sacramento, Calif. 95826

Filed Apr. 24, 1972, Ser. No. 246,959
Int. Cl. A47g 33/06
U.S. Cl. 161—23 8 Claims

This invention relates to an asymmetrical artificial tree assembly which may be adapted to receive decorations for use as an artificial Christmas tree including a base member for supporting a plurality of angular elements to define at least a

portion of a cone. Each of the angular elements include an arm member extending radially from the base member and an upright strut member wherein the upright strut members are joined at the apex of the cone. The assembly includes a base



member which is adapted to receive the angular elements in a plurality of selectively interchangeable configurations which form at least a full tree assembly, a half tree assembly, and a quarter tree assembly.

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**3,819,460**

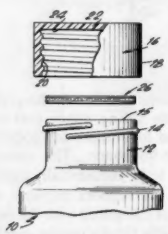
**MATERIAL FOR CAP LINER**

**Joseph Dukess, 931 Greacen Point, Mamaroneck, N.Y.**

**Continuation-in-part and Division of Ser. No. 855,155, Sept. 3, 1969, Pat. No. 3,595,419. This application July 21, 1971, Ser. No. 164,658**

**Int. Cl. B32b** *31/20*

**U.S. Cl. 161—42** **1 Claim**



Material for cap liners in the form of a sandwich and so arranged that a compressible intermediate layer of relatively great thickness is disposed between two relatively thin nonresilient layers. The intermediate layer can be squeezed beyond the periphery of the material for making a better seal.

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**3,819,461**

**UNIDIRECTIONAL, HIGH MODULUS KNITTED FABRICS**

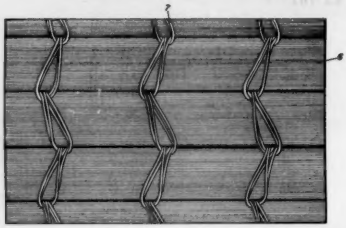
**Richard R. Saffadi, Ridgefield, N.J., assignor to J. P. Stevens & Co., Inc., New York, N.Y.**

**Continuation-in-part of Ser. No. 851,408, Aug. 19, 1969, abandoned. This application Oct. 8, 1971, Ser. No. 187,674**

**Int. Cl. B32b** *5/12*

**U.S. Cl. 161—58** **4 Claims**

Unidirectional reinforcing fabric for resin laminates and the laminates including it, in which parallel yarns of fibers of very high modulus of elasticity, in excess of 8 million pounds per square inch, such as high modulus graphite yarn, with or without some glass fiber yarn, are maintained parallel and uncrimped by knitting them together using a fine, flexible knitting yarn. None of the knitting stitches penetrate any of the high modulus yarns. The wales are very widely spaced relative to high modulus yarn cross-section, in excess of two



and one-half times with the coarsest material. The stitches are chain stitches, and the very brittle high modulus graphite is not bent or crimped and is maintained parallel by the chain stitches of fine, flexible knitting yarn.

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**3,819,462**

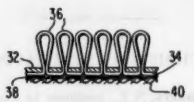
**PRIMARY BACKING FOR TUFTED CARPETS**

**John R. Starr, Belmont, and Arthur P. Drennan, Brighton, both of Mass., assignors to Cotton, Incorporated, New York, N.Y.**

**Filed Oct. 12, 1970, Ser. No. 79,762**

**Int. Cl. D03d** *27/00*; **D04h** *11/00*

**U.S. Cl. 161—62** **9 Claims**



A tufted carpet primary backing made up of a nonwoven base web formed from low cost short fine fibers (e.g. cotton) and longer coarse fibers (e.g. 4 inch, 15 denier synthetic fibers) bonded together. The nonwoven is needled and reinforced by the addition of other strength imparting components, such as threads or continuous filaments stitched on the web in a tricot pattern.

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**3,819,463**

**CARPET AND PREPARATION THEREOF**

**Gary D. Ervin, Delran, N.J., and Harold A. Walters, Beaverton, Mich., assignors to The Dow Chemical Company, Midland, Mich.**

**Continuation-in-part of Ser. No. 199,807, Nov. 17, 1971, abandoned. This application Nov. 6, 1972, Ser. No. 304,045**

**Int. Cl. D04h** *11/00*

**U.S. Cl. 161—64** **7 Claims**

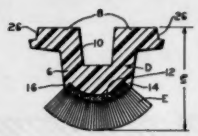
A highly satisfactory carpet is prepared by applying to the back of a filamentary carpet a mixture of expandable microspheres and a film forming binder, drying and foaming the mixture on the carpet back. The resultant backed carpet shows excellent resiliency and resistance to permanent set.

3,819,464

## WEATHER STRIP AND METHOD OF MAKING

Aaron J. Ungerer, Lakewood, Ohio, assignor to The Standard Products Co., Cleveland, Ohio

Continuation of Ser. No. 89,582, Nov. 16, 1970, abandoned. This application Jan. 2, 1973, Ser. No. 320,297
Int. Cl. B32b 3/00; E06b 7/22
U.S. Cl. 161—64 10 Claims




A flocked weather strip for insertion into a T-shaped recess of a door or door frame for engagement with the other upon closing. The weather strip is comprised of a T-shaped member of plastic with flocking adhered to the end of the upright. The end of the upright is so shaped that the adhesive used does not flow onto the sides of the upright.

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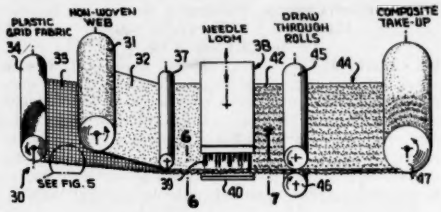
3,819,465

## NON-WOVEN TEXTILE PRODUCTS

Robert A. Parsons, Troy, N.H., and Alfred E. Guidotti, Chelmsford, Mass., assignors to Troy Mills, Inc., Troy, N.H.

Filed Apr. 29, 1969, Ser. No. 820,049
Int. Cl. B32b 5/06
U.S. Cl. 161—74 17 Claims




This disclosure relates to composite textile constructions formed by needle punching non-woven fibers into a layer of plastic material. In one embodiment a batt of non-woven fibers is needle punched into a plastic sheet and the composite laminate then hot calendered to press the punched fibers into the plastic sheet thereby forming a smooth surface. In another embodiment a non-woven batt is is needle punched into a heat-retractable plastic grid or shrinkable carrier. The grid is then caused to retract under dimensionally controlled conditions whereby the fibers in the unpunched portions of the batt will rise up in arch-like ridges or designs out of the plane of the batt thereby presenting a resilient textured surface.

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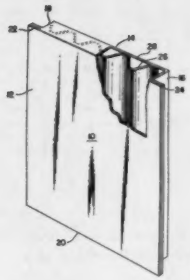
3,819,466

## REINFORCED AND INSULATING BUILDING PANEL

Armand G. Winfield, and Barbara L. Winfield, both of Lindenhurst, N.Y., assignors to Care, Inc., New York, N.Y.

Filed June 18, 1973, Ser. No. 371,027
Int. Cl. B32b 5/02, 27/12; E04c 2/32
U.S. Cl. 161—89 6 Claims

A double-walled reinforced and insulating building panel, having an inner skin constructed from a plurality of woven jute layers saturated in polyester resin, an outer skin constructed of a single base layer of woven jute with an exterior coating of chopped glass fibers saturated in resin and an intervening corrugated layer constructed of a plurality of woven jute layers and saturated in polyester resin and bonded between the inner and outer skin. The panel is characterized by its light weight and durability under extremes of temperature and wind, as well as the extreme economy of construction in using woven jute as the reinforcing element.

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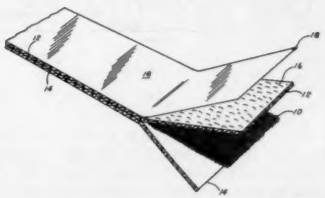
3,819,467

## LAMINATED ADHESIVE TAPE

William Kovac, 1516 S. Ironton, Denver, Colo. 80010

Filed June 22, 1972, Ser. No. 265,155
Int. Cl. B32b 15/08, 3/10
U.S. Cl. 161—113 4 Claims




An easily creasible and crease-retaining core, sealed between two layers of a non-woven fabric, and having at least one side covered with a non-drying, self-sticking adhesive. A modification coats both sides of the covered core with adhesive.

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3,819,468

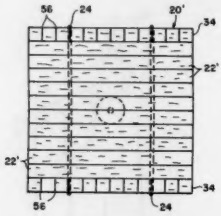
## HIGH TEMPERATURE INSULATION MODULE

Robert A. Sauder; Gary R. Kendrick, and John R. Mase, all of Emporia, Kans., assignors to Sander Industries, Inc., Emporia, Kans.

Filed June 28, 1971, Ser. No. 157,433
Int. Cl. C04b 43/02
U.S. Cl. 161—152 20 Claims

A ceramic fiber mat attached to the interior wall or surface of a high temperature chamber or furnace or adapted to overlie an intermediate insulating member positioned between the

mat and a furnace wall, the fibers in the mat lying in planes generally perpendicular to the wall, the mat constituting an




improved insulation for the wall where the interior of the chamber or furnace will be operating at temperatures in excess of 1600° F.

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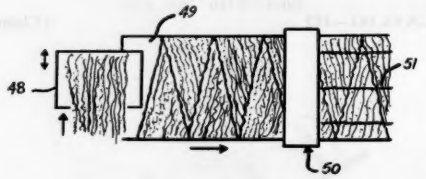
**3,819,469**
**STITCHED NONWOVEN WEBS**

**Ralph H. Balch, Charlotte; George A. Watson, Davidson, and Herbert W. Coates, Charlotte, all of N.C., assignors to Celanese Corporation, New York, N.Y.**

**Continuation-in-part of Ser. No. 658,781, Aug. 7, 1961, Pat. No. 3,505,155. This application Apr. 6, 1970, Ser. No. 25,676**
**Int. Cl. B32b** *5/06*
**U.S. Cl. 161—154** **11 Claims**




A non-woven continuous filament product and a method for producing said product which comprises deregistering a crimped tow of continuous filaments, spreading the deregistered tow to produce a web, cross-lapping the web into a batt and subsequently dimensionally stabilizing the batt by stitching, in the absence of a supporting fabric.

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**3,819,470**
**MODIFIED CELLULOSIC FIBERS AND METHOD FOR PREPARATION THEREOF**

**David L. Shaw, and Edward A. Wodka, both of Philadelphia, Pa., assignors to Scott Paper Company, Philadelphia, Pa.**

**Filed June 18, 1971, Ser. No. 154,680**
**Int. Cl. B22c** *17/08*
**U.S. Cl. 162—157 C** **22 Claims**

Modified cellulosic fibers, characterized by improved properties, such as reduced swellability and reduced natural fiber-to-fiber bonding, are produced by a process which comprises treating an aqueous slurry of the fibers with a substantive polymeric compound, drying the treated fibers to cause the polymeric compound to react with itself and with the fibers, and refiberizing in water to separate the individual, treated fibers. The fibers are useful in the preparation of improved cellulosic sheet materials which exhibit increased bulk and reduced tensile strength.

**3,819,471**
**PRINTING BLANKET, ESPECIALLY FOR OFFSET PRINTING**

**Richard Sohnemann, Northeim, Germany, assignor to Continental Gummi-Werke Aktiengesellschaft, Hannover, Germany**

**Filed Nov. 28, 1972, Ser. No. 310,093**
**Claims priority, application Germany, Nov. 29, 1971, 2159085**
**Int. Cl. B32b** *5/16*
**U.S. Cl. 161—162** **7 Claims**

A printing blanket, especially for offset printing, comprising a strength carrier layer, an intermediate layer, and an ink transfer layer comprising a polymer base, filler materials containing hydroxyl groups, and high molecular weight, surface active substances.

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**3,819,472**
**COATING COMPOSITION OF AN AROMATIC POLYSULFONE RESIN, AN EPOXY RESIN, AND N-CYCLOHEXYL TOLUENE SULFONAMIDE**

**Joseph A. Vasta, Woodbury, N.J., assignor to E. I. duPont de Nemours and Company, Wilmington, Del.**

**Filed Mar. 13, 1973, Ser. No. 340,847**
**Int. Cl. C08g** *51/04*
**U.S. Cl. 161—185** **8 Claims**

The novel coating composition is a mixture of an aromatic polysulfone resin and an epoxy resin and is useful as an adhesive and as a protective coating composition for wood, metal, wire, glass and plastics; finishes of the novel composition have excellent stain resistance, good thermal stability, scratch, mar and impact resistance and are useful as an appliance finish, a vending machine finish and an industrial equipment finish.

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**3,819,473**
**SHEET METAL LAMINATE BONDED WITH ETHYLENE COPOLYMER-POLYAMIDE ADHESIVE**

**Philip W. Russell, Belmont; Charles W. Simons, Bedford, and Francis L. Chupka, Jr., Billerica, all of Mass., assignors to W. R. Grace & Co., New York, N.Y.**

**Division of Ser. No. 165,365, July 22, 1971, abandoned. This application Oct. 12, 1972, Ser. No. 297,125**
**Int. Cl. B32b** *15/08, 7/14;* **B65b** *7/38*
**U.S. Cl. 161—214** **1 Claim**

A novel adhesive consisting of a blend of a polyamide with 1 to 15 percent of certain polymer and copolymer additives is described, together with its use in lap-seaming lacquered metal (e.g., tin-free steel or aluminum) containers.

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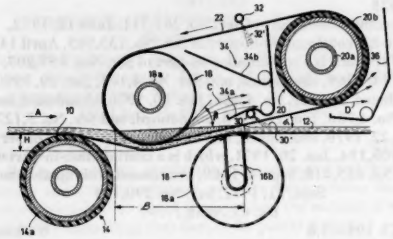
**ERRATUM**

For Class 162—157 see:
Patent No. 3,819,470

## 3,819,474
## ENDLESS SIEVE BELT DRAINING DEVICE FOR PAPER MACHINES

Emil Holz, Eningen, Wurttenberg, Germany, assignor to Hermann Finckh Metalltuch-und Maschinenfabrik, Ruetlingen/Wurtt, Germany

Filed June 30, 1972, Ser. No. 268,103
Claims priority, application Germany, July 1, 1971, 2132713
Int. Cl. B01d *33/04*; D21f *1/48*
U.S. Cl. 162—313 22 Claims

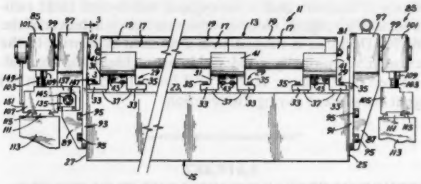


A draining device for a paper making machine including a longitudinal sieve which carries a slurry of paper material, a rotatable draining roller, at least one further roller, a pair of register rollers disposed with one on each side of the draining roller, and an endless sieve belt. The draining roller has a sieve-type outer surface. The endless sieve belt extends over the draining roller and the further roller and moves over these rollers at the same linear velocity as the longitudinal sieve. The endless sieve draining belt extends approximately parallel to the longitudinal sieve between the register rollers.

## 3,819,475
## ROTATABLE PAPERMAKING MACHINE SUPPORT STRUCTURE THEREFOR

Charles A. Lee, Knoxville, and Robert F. Hunt, Concord, both of Tenn., assignors to International Paper Company, New York, N.Y.

Filed July 19, 1972, Ser. No. 273,348
Int. Cl. D21f *1/36*
U.S. Cl. 162—354 15 Claims

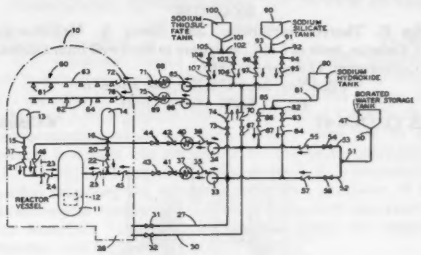


A support structure for supporting a plurality of ceramic drainage bar elements in end-to-end relation for substantially straight-line contact with the moving forming carrier of a Fourdrinier papermaking machine and the like, wherein the ceramic drainage elements have identical generally tubular configurations and are fixedly supported by mounting saddles on a support beam to maintain the elements in relatively rigid axial alignment. The support beam is mounted for rotation about an axis coincident with the longitudinal axis of the aligned drainage elements to control the suction acting on the forming carrier.

## 3,819,476
## INDUSTRIAL TECHNIQUE

Frederick J. Pocock, Louisville, and William G. Leedy, Alliance, both of Ohio, assignors to The Babcock & Wilcox Company, New York, N.Y.

Filed Sept. 1, 1971, Ser. No. 177,063
Int. Cl. G21c *9/00*
U.S. Cl. 176—37 3 Claims



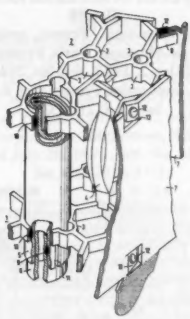

In an illustrative embodiment of the invention, approximately 0.1 percent by weight of sodium silicate is added to an aqueous radioiodine absorbing and decay heat removing spray mixture for discharge within a nuclear reactor containment building.

The radioactive decontamination fluid preferably includes 1 percent by weight of sodium thiosulfate, 1.22 percent by weight of boric acid and 0.528 percent by weight of sodium hydroxide in a water solution. The added sodium silicate allows less expensive aluminum components to be used within the containment building because it inhibits a corrosive chemical reaction between the aluminum and the sodium hydroxide. Without the inhibitor, the aluminum-hydroxide reaction would lead to a potentially explosive mixture of hydrogen and oxygen within the containment building.

## 3,819,477
## SPACER FOR FUEL RODS OF NUCLEAR LIGHT-WATER REACTORS

Gustav Fromel, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Dec. 6, 1972, Ser. No. 312,510
Claims priority, application Germany, Dec. 10, 1971, 2161229
Int. Cl. G21c *3/34*, *3/30*
U.S. Cl. 176—76 9 Claims



The spacer consists of two grid elements arranged in parallel to one another and spaced apart at a distance; leaf springs for the fuel rods; and spacer bushings which extend between

the two grid elements in positions provided for control rod guide tubes. Each spacer bushing encloses an associated control rod guide tube. The spacer bushing is connected with the grid elements and also with the associated control rod guide tube at at least one point, preferably by spot welding.

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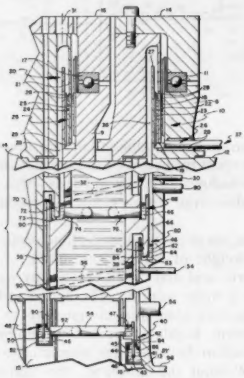
**3,819,478**

## TOP SHIELD SEALING SYSTEM OF A NUCLEAR REACTOR

**John P. Thorel, Northridge, and James A. McEdwards, Calabasas, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.**

**Filed Nov. 24, 1971, Ser. No. 201,870**
**Int. Cl. G21c** *11/00, 13/06*
**U.S. Cl. 176—87** **6 Claims**



The top shield of a typical fast breeder reactor contains one or more rotatable plugs, the rotatable plugs being separated from the coolant liquid by an annulus adjacent the plug. Two dip seals using liquid sodium in a trough are used in series to seal the primary coolant and cover gas from the top shield annuli. A third dip seal in series with the first two uses a low melting point alloy frozen during normal reactor operation to seal the reactor core cover gas from the operating floor atmosphere.

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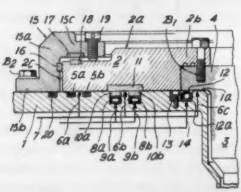
**3,819,479**

## SUPPORTING AND SEALING DEVICE APPLICABLE TO ROTARY SEAL PLUGS IN NUCLEAR REACTOR SHIELD SLABS

**Roland Jacquelin, Manosque, France, assignor to Commissariat A L'Energie Atomique, Paris, France**

**Filed Oct. 2, 1972, Ser. No. 294,366**
**Claims priority, application France, Oct. 6, 1971, 71.35970**
**Int. Cl. G21c** *13/06*
**U.S. Cl. 176—87** **5 Claims**



The top face of the reactor shield slab is provided in the portion adjacent to the seal plug opening with a flat bearing rim which supports the annular flange of the plug and is slightly raised with respect to the remainder of the slab.

Provision is made between the plug flange and the top slab face for sealing means consisting of flexible O-ring seals, sliding means consisting of friction slideways, lifting means consisting of inflatable seals, ducts being provided in the slab for injecting a barrier of neutral gas under pressure.

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**3,819,480**

## COMPOSITION OF METHIONINE WITH 2-DIMETHYLAMINOETHANOL

**Richard Hochschild, 2915 Pebble Dr., Corona Del Mar, Calif. 92625**

**Continuation-in-part of Ser. No. 261,711, June 12, 1972, which is a continuation-in-part of Ser. No. 133,985, April 14, 1971, which is a continuation-in-part of Ser. Nos. 857,207, Sept. 11, 1969, abandoned, and Ser. No. 4,103, Jan. 19, 1970, abandoned, and Ser. No. 4,426, Jan. 20, 1970, abandoned, and Ser. No. 4,766, Jan. 21, 1970, abandoned, and Ser. No. 5,127, Jan. 22, 1970, abandoned, and a continuation-in-part of Ser. No. 108,194, Jan. 20, 1971, which is a continuation-in-part of Ser. No. 855,418, Sept. 4, 1969, abandoned. This application Sept. 21, 1972, Ser. No. 290,791**
**Int. Cl. A61k** *17/00*
**U.S. Cl. 195—1.8** **8 Claims**

A therapeutic composition of methionine with 2-dimethylaminoethanol in aqueous media. A method of extending life span in animals and the survival time of cells, tissues and organs in vitro by treatment with a mixture of methionine and 2-dimethylaminoethanol or materials which form 2-dimethylamino-ethanol in aqueous media.

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**3,819,481**

## PROCESS FOR PREPARING NICOTINAMIDE ADENINE DINUCLEOTIDE PHOSPHATE

**Yoshiaki Shimizu; Yoshiyuki Akiyama, and Toshio Tatano, all of Shizuoka-ken, Japan, assignors to Kyowa Hakko Kogyo Kabushiki Kaisha, Tokyo, Japan**

**Filed Oct. 18, 1971, Ser. No. 190,413**
**Claims priority, application Japan, Oct. 27, 1970, 45-93911**
**Int. Cl. C12d** *13/06*
**U.S. Cl. 195—28 N** **15 Claims**

A process for preparing nicotinamide adenine dinucleotide phosphate (NADP) by reacting nicotinamide adenine dinucleotide with adenosine triphosphate in the presence of nicotinamide adenine dinucleotide (NAD) kinase. The NAD kinase may be in the crude form and appreciable quantities of NADP are produced if the reaction takes place in the presence of fluoride and/or an organic sulf-hydral (SH) radical containing reagent. Good production also is achieved if the crude NAD kinase is treated with a mineral acid prior to the reaction. Exceptionally good yields are achieved if an acid-pretreated NAD kinase is used and both fluoride and an SH reagent are present during the reaction.

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**3,819,482**

## METHOD OF PREPARING HIGH YIELDS OF DOUBLE-STRANDED RIBONUCLEIC ACID

**Anne M. Vidaver, 2416 Sewell St., Lincoln, Nebr. 68502; James L. Van Etten, 4507 E. Eden Dr., Lincoln, Nebr. 68506, and Joseph S. Semancik, 335 Bruce Dr., Lincoln, Nebr. 68510**

**Filed May 8, 1972, Ser. No. 251,257**
**Int. Cl. C12d** *13/06*
**U.S. Cl. 195—28 N** **8 Claims**

An unusual bacteriophage $\phi$ 6, ATCC No. 21781-B, containing a lipid coat and double-stranded ribonucleic acid has been isolated for the plant pathogenic bacterium *Pseudomonas phaseolicola* ATCC No. 21781. High yields of double-stranded ribonucleic acid may be obtained rapidly and expediently by

cultivating a host bacterium for the bacteriophage, infecting the host bacteria with the bacteriophage to provide a lysate and recovering double-stranded ribonucleic acid from the separated bacteriophage.

The intact or whole bacteriophage, the bacteriophage with its lipid coat removed, and the isolated nucleic acid have all been found to be effective interferon inducers.

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3,819,483

## METHOD OF PRODUCING L-PROLINE BY FERMENTATION

**Fumihiro Yoshinaga; Takayasu Tsuchida, both of Kawasaki, and Shinji Okumura, Tokyo, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan**

**Filed Jan. 26, 1973, Ser. No. 326,661**
**Int. Cl. C12d** *1/00*
**U.S. Cl. 195—29** **5 Claims**

Proline-producing, artificially induced mutants of Brevibacterium and Corynebacterium produce more proline than the respective parent strains if the growth of the mutants is less inhibited by sulfa drugs than that of the parent strains.

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3,819,484

## PROCESS FOR PREPARING SUCROSE-STARCH SWEETNER FREE FROM REDUCING SUGAR

**Shigetaka Okada, Nara; Naoto Tsuyama, Okayama; Masakazu Mitsuhashi, Okayama, and Junsuke Ogasawara, Okayama, all of Japan, assignors to Ken Hayashibara, Okayama-ken, Japan**

**Filed Dec. 13, 1971, Ser. No. 207,578**
**Claims priority, application Japan, Dec. 16, 1970, 45-111840; Dec. 23, 1970, 45-115768**
**Int. Cl. C12b** *1/00*
**U.S. Cl. 195—31 R** **10 Claims**

A sweetner having some of the properties of dextrin while being practially free of reducing sugars is prepared by subjecting sucrose and dextrin to cyclodextrin-glycosyl-transferase in an aqueous medium. Depending on the ratio of sucrose and dextrin, the product obtained after destroying the enzyme and purifying the fermentation mixture may be as sweet as an equal weight of the sucrose used or primarily show the properties of dextrin solution. It is useful in preparing food in which either or both properties are desired. The product is more stable thermally and chemically than sweetners containing reducing sugars.

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3,819,485

## PROCESS FOR PRODUCING SPECTINOMYCIN

**Takashi Nara; Seigo Takasawa; Ryo Okachi; Isao Kawamoto; Masaru Kumakawa; Mitsuyoshi Yamamoto, and Seiji Sato, all of Tokyo, Japan, assignors to Abbott Laboratories, Chicago, Ill.**

**Filed July 3, 1972, Ser. No. 268,764**
**Int. Cl. C12d** *9/00*
**U.S. Cl. 195—80 R** **3 Claims**

The antibiotic spectinomycin is produced by culturing *Streptomyces hygroscopicus* var. *sagamiensis* in a nutrient medium and thereafter recovering the antibiotic from the culture liquor.

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3,819,486

## PROCESS FOR THE PREPARATION OF PEPSIN INHIBITORS

**Sawao Murao, Osaka; Shuzo Satoi; Noriaki Kuwana, both of Tokyo; Masayuki Fukumura, Hyogo, and Tamio Kawamura, Kanagawa, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan**

**Division of Ser. No. 138,083, April 28, 1971. This application Jan. 12, 1973, Ser. No. 323,243**
**Claims priority, application Japan, Apr. 29, 1970, 45-35900**
**Int. Cl. C12d** *13/06*
**U.S. Cl. 195—80 R** **7 Claims**

New substances named "substance S–PI" and "substance Me S–PI" are concerned which are effective as pepsin inhibitor, the latter substance being methyl ester of the former. The substance S–PI is prepared by fermentation of a new strain of microorganism which has been isolated from soil by the present inventors and named the Streptomyces naniwaensis (EF 44–201), whereas the substance Me S–PI is prepared by methyl esterfying the former substance. A specimen of the Streptomyces naniwaensis (EF 44–201) has been deposited to the American Type Culture Collection under the assigned Number ATCC 21689.

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3,819,487

## STABLE NADH COMPOSITIONS

**Erich Bernt, Munich; Hans Ulrich Bergmeyer, Tutzing, Upper Bavaria; Marianne Grassl, Munich; Wolfgang Gruber, Garatshausen, and Klaus Beaucamp, Tutzing, Upper Bavaria, all of Germany, assignors to Boehringer Mannheim GmbH., Mannheim, Germany**

**Filed Sept. 17, 1971, Ser. No. 181,640**
**Claims priority, application Germany, Oct. 13, 1970, 2050267**
**Int. Cl. G01n** *31/14*
**U.S. Cl. 195—99** **6 Claims**

Storage stable reduced nicotinamide-adenine-dinucleotide (NADH) compositions, which do not form dehydrogenase inhibitors of prolonged time periods, are produced by forming a dilute aqueous solution of inhibitor-free NADH and maintaining this solution in a thin layer vacuum.

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3,819,488

## DIAGNOSTIC COMPOSITIONS FOR GLUTAMIC OXALIC TRANSAMINASE (GOT) AND GLUTAMIC PYRUVIC TRANSAMINASE (GPT) DETERMINATIONS

**Robert L. Rush, Spring Valley; Luis P. Leon, Ossining, and Anne C. De Lea, Yonkers, all of N.Y., assignors to Technicon Instruments Corporation, Tarrytown, N.Y.**

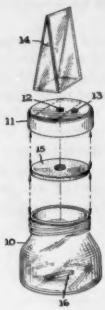
**Filed July 20, 1971, Ser. No. 164,415**
**Int. Cl. G01n** *31/14*
**U.S. Cl. 195—103.5 R** **46 Claims**

Stable, lyophilized diagnostic compositions are disclosed effective in determining glutamic oxalic transaminase (GOT) and glutamic pyruvic transaminase (GPT) comprising malate dehydrogenase (for GOT) or lactate dehydrogenase (for GPT), a pyridine nucleotide and a buffer having a sodium content of less than about 600 meq./l. capable of regulating the pH of the composition in reconstituted form. Also disclosed are the aqueous reconstituted products, the method of determining the activity of GOT and GPT in a sample using the subject compositions and the process for making the disclosed diagnostic compositions.

## 3,819,489
## BACTERIA DETECTOR

Melvyn N. Kronick, Stanford, Calif.; James MacLowry, and Daniel Bruce, both of Bethesda, Md., assignors to The United States of America, as represented by the Secretery of Health, Education and Welfare

Filed Sept. 9, 1971, Ser. No. 178,890
Int. Cl. C12k *1/04*
U.S. Cl. 195—127 1 Claim

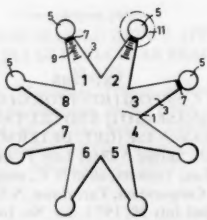



A method of automatically screening bio-fluid samples for bacterial contamination. A scintillation vial is fitted with a special top in the shape of a tent made of scintillator plastic. Bacteria present in the sample will feed on carbon-14 glucose releasing carbon-14 dioxide. When the carbon-14 dioxide strikes the scintillator plastic, light flashes will be emitted, enabling the user to detect and count the amount of radiation in a standard automatic scintillation counter.

## 3,819,490
## TESTING DEVICE FOR USE WHEN MAKING BACTERIOLOGICAL TESTS

Emil Allan Klingstrom, Radjursstigen 42, S-171 72 Solna, and Sten Martin Johansson, Allevagen 53, S-191 77 Sollentuna, both of Sweden

Filed Dec. 8, 1971, Ser. No. 205,785
Int. Cl. C12k *1/10*
U.S. Cl. 195—127 3 Claims




The invention concerns a preferably star-shaped testing device for bacteriological tests. Circular discs of filter paper impregnated with different antibiotics are interconnected by arms of the same material. At least adjacent the discs, said arms are impregnated so as to break the capillary action of the filter paper and prevent migration of the antibiotic into the arm. The arms are also provided with scales permitting simple determination of the clear zones around the discs when the testing device is put on a culture plate.

## 3,819,491
## SEPARATING ADIPONITRILE FROM MIXTURES

Colin Moore, and Michael Joseph Thornton, both of Blackley, England, assignors to Imperial Chemical Industries Limited, London, England

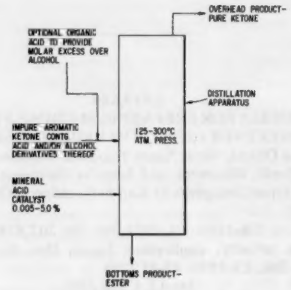
Filed July 24, 1972, Ser. No. 274,428
Claims priority, application Great Britain, July 23, 1971, 34624/71
Int. Cl. C07c *121/26*
U.S. Cl. 203—29 7 Claims

2-Cyanocyclopenten-(1)-ylamine, an impurity in adiponitrile is removed from it by heating the mixture under pressure with water substantially free from dissolved inorganic matter to hydrolyse the impurity, and then separating adiponitrile from the hydrolysis product by distillation.

## 3,819,492
## DISTILLATION OF AROMATIC KETONE FROM AROMATIC ALCOHOL WITH ACID

John L. Stevenson, and William E. Archibald, both of Big Spring, Tex., assignors to Cosden Oil & Chemical Company, Big Spring, Tex.

Filed Nov. 8, 1971, Ser. No. 196,768
Int. Cl. B01d *3/34*
U.S. Cl. 203—34 11 Claims




A process for purifying aromatic ketones from admixture with difficultly separable aromatic acid and alcohol derivatives of said ketone by distillation in the presence of a catalytic amount of a mineral acid.

## 3,819,493
## PROCESS FOR SEPARATING HALOGENATED HYDROCARBONS BY EXTRACTIVE DISTILLATION

George B. Fozzard, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 26, 1973, Ser. No. 354,549
Int. Cl. B01d *3/40*; C07c *17/38*
U.S. Cl. 203—70 5 Claims

A process for separating 1,1,1,2-tetrafluoroethane from a first mixture of 1,1,1,2-tetrafluoroethane and 1,1-difluoroethane by adding a saturated hydrocarbon having in the range of 4–10 carbon atoms per molecule to the first mixture and extractively distilling the second mixture.

## 3,819,494
## METHOD OF REMOVING BRAZE

Laurence R. Fountain, West Springfield, Mass., assignor to Fountain Plating Company, Inc., West Springfield, Mass.

Filed Mar. 29, 1973, Ser. No. 346,181
Int. Cl. B01k *1/00*, *3/00*
U.S. Cl. 204—146 5 Claims

A method of removing a gold alloy braze having palladium or niobium in combination therewith, wherein the braze is first

treated with an aqueous solution of an alkali cyanide and a nitro-substituted aromatic compound, then treated with an acid stripping solution and finally treated with an aqueous solution of an alkali cyanide and a chelating agent in the presence of an electric current.

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3,819,495

## STABILIZER SYSTEMS FOR LIGHT-CURABLE POLYESTERS

**Lodewijk Roskott, Deventer; Arnoldus Adrianus Maria Groenendaal, Vorden, and Hans Jaspers, Diepenveen, all of Netherlands, assignors to Akzo N.V., Arnhem, Netherlands**

**Filed Jan. 31, 1973, Ser. No. 328,438**

**Claims priority, application Netherlands, Feb. 4, 1972, 7201453**

**Int. Cl. B01j** *1/10, 1/12*

**U.S. Cl. 204—159.19** **17 Claims**

A stabilized composition curable by U.V. light, comprising an unsaturated polyester resin, a benzoin ether of a primary alcohol, a copper compound soluble in the polyester resin and at least one organic compound having ionically-bound chlorine or capable of forming chlorine ions in situ.

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3,819,496

## STABILIZER SYSTEMS FOR LIGHT-CURABLE POLYESTERS

**Lodewijk Roskott, Deventer, and Arnoldus Adrianus Maria Groenendaal, Vorden, both of Netherlands, assignors to Akzo N.V., Arnhem, Netherlands**

**Filed Jan. 31, 1973, Ser. No. 328,440**

**Claims priority, application Netherlands, Feb. 21, 1972, 7202217**

**Int. Cl. B01j** *1/10, 1/12*

**U.S. Cl. 204—159.19** **14 Claims**

A stabilized, U.V. light curable composition comprising a mixture which contains an unsaturated polyester resin, a benzoin ether of a primary or secondary alcohol and, as a stabilizer for the composition, an iron and/or manganese compound soluble in the polyester resin and at least one organic compound having ionically-bound chlorine or capable of forming chlorine ions in situ.

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3,819,497

## ELECTROLESS AND ELECTROLYTIC COPPER PLATING

**John J. Grunwald, New Haven; Harold L. Rhodenizer, Bethlehem; and Leo J. Slominski, Bristol, all of Conn., assignors to MacDermid Incorporated, Waterbury, Conn.**

**No Drawing. Division of Ser. No. 858,837, Sept. 17, 1969, now Pat. No. 3,694,250. This application July 19, 1972, Ser. No. 273,145**

**Int. Cl. C23b** *5/48, 5/52*

**U.S. Cl. 204—15** **5 Claims**

Copper surfaces are plated in a process comprising etching, activating, electroless and electrolytic copper deposition, and heating or baking at a temperature of about 150° to about 450° F. for about 10 min. to about 2 hours or more, Substantial improvement in the adhesion between the copper surface and the metal deposited by electroless and electrolytic plating is achieved. Processes for plating on copper-clad plastic substrates and for the manufacture of printed circuit boards are also set forth.

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3,819,498

## HOT MELT COMPOSITIONS PRODUCED BY IRRADIATING ETHYLENE COPOLYMERS IN THE PRESENCE OF WAX

**Joseph Dominic Domine, Somerville, and Roy Henry Schaufelberger, Basking Ridge, both of N.J., assignors to Union Carbide Corporation, New York, N.Y.**

**Filed July 20, 1972, Ser. No. 273,542**

**Int. Cl. B01j** *1/10, 1/12*

**U.S. Cl. 204—159.14** **6 Claims**

Hot melt compositions are produced by preparing a concentrate of wax and copolymer, irradiating the concentrate to produce an irradiated concentrate and then diluting the irradiated concentrate with additional quantities of wax to obtain the hot melt composition. The improved three step method permits the incorporation of copolymers having higher molecular weights in the hot melt composition; it was also found that the copolymers are more readily dissolved in the wax. The copolymers used are the ethylene-vinyl acylate and ethylene-alkyl acrylate copolymers.

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3,819,499

## DEVICE FOR DETECTING ONE OR MORE OXIDIZABLE COMPONENTS IN A SAMPLE

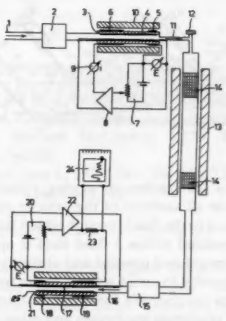
**Leonardus Petrus Johannes Hoogeveen, and Petrus Floris Butzelaar, both of Emmasingel, Eindhoven, Netherlands, as signors to U.S. Philips Corporation, New York, N.Y.**

**Filed Apr. 20, 1972, Ser. No. 245,785**

**Claims priority, application Netherlands, Apr. 30, 1971, 7105976**

**Int. Cl. B01k** *3/00*

**U.S. Cl. 204—195 S** **3 Claims**



A device for detecting oxidizable components in a mixture in a reaction space through which a constant stream of gas is passed. A measuring and dosing cell for oxygen maintaining the oxygen content at an adjusted value is present before and after the reaction space. After injection of the sample the dosage current required for oxygen supplementation is a measure of the quantity of oxidizable component.

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3,819,500

## MEASURING CELL FOR DETERMINING OXYGEN CONCENTRATIONS IN A GAS MIXTURE

**Johannes Van Esdonk, and Petrus Jacobus Poolman, both of Emmasingel, Eindhoven, Netherlands, assignors to U. S. Philips Corporation, New York, N.Y.**

**Filed Jan. 22, 1973, Ser. No. 325,867**

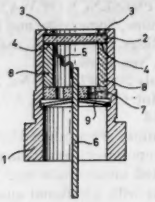
**Claims priority, application Netherlands, Feb. 21, 1972, 7202272**

**Int. Cl. G01n** *27/30, 27/46*

**U.S. Cl. 204—195 S** **6 Claims**

A measuring cell for determining oxygen concentrations in an exhaust mixture, consisting of a metal housing in which a

detachable plate of stabilised $ZrO_2$ is clamped between two metal rings, one ring establishing contact with the housing and



the other with a lead-through conductor which is present in an insulating plate provided with gas stream apertures.

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**3,819,501**

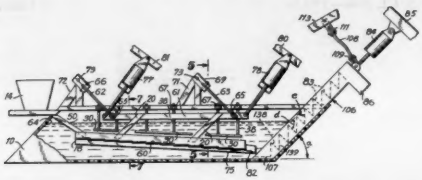
**CONTINUOUS PLATING SYSTEM**

**Elbert R. Faust, Litchfield, Conn., assignor to The Buerhler Corporation, Indianapolis, Ind.**

**Division of Ser. No. 120,635, March 3, 1971, Pat. No. 3,699,985, which is a continuation-in-part of Ser. No. 796,033, Feb. 3, 1969, Pat. No. 3,616,423. This application June 29, 1972, Ser. No. 267,496**

**Int. Cl. B01k** *1/00*

**U.S. Cl. 204—198** **4 Claims**



A system for the continuous plating, cleaning or rinsing of articles wherein all surfaces of the articles are uniformly and entirely exposed to the fluid through which they are conveyed. A trough suspended within a fluid bath is operative to cyclically move forward and upward and abruptly return to its initial position thereby to cause articles in the trough to inertially fall to positions successively forward of the trough and in new positions with respect to the trough and other articles.

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**3,819,502**

**LINE- AND SPOTPLATING MACHINE**

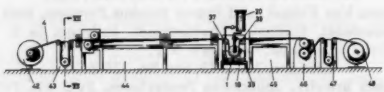
**Pieter W. Meuldijk, Vught, and Ben J. Roodnat, 's-Hertogenbosch, both of Netherlands, assignors to Meco Metal Finishing Engineers N.V., 's-Hertogenbosch, Netherlands**

**Filed May 25, 1972, Ser. No. 256,847**

**Claims priority, application Netherlands, May 25, 1971, 717171; July 7, 1971, 719404**

**Int. Cl. C23b** *5/68*

**U.S. Cl. 204—206** **23 Claims**



Apparatus for continuously plating metal on a metal strip including a plating wheel defining an electrolysis chamber with an annular slot opening at the periphery thereof, an anode mounted on the plating wheel in the electrolysis chamber, a closed system for supplying electrolyte to the electrolysis chamber, and a shoulder on the periphery of the wheel to receive a metal strip to be plated, the metal strip closing at least a portion of the slot opening to define a wall of the electrolysis chamber and functioning as a cathode such that the metal strip has a metal pattern plated on the side supported on the shoulder.

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**3,819,503**

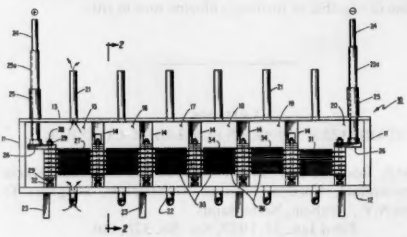
**ELECTROLYTIC CELL FOR THE PRODUCTION OF OXYHALOGENS**

**Harold V. Casson, Toronto, Ontario; James S. Bennett, Thornhill, Ontario, both of Canada, and Richard E. Loftfield, Chardon, Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio and Huron Chemicals Limited, Toronto, Ontario, Canada**

**Filed Sept. 22, 1972, Ser. No. 291,274**

**Int. Cl. B01k** *3/00*

**U.S. Cl. 204—268** **9 Claims**



Multi-polar electrolytic cells for manufacturing oxyhalogen compounds include terminal compartments containing monopolar electrodes, and a number of bipolar electrode compartments interposed between the terminal compartments, each compartment being substantially enclosed and non-communicating with the other compartments. Open-ended electrically insulating conduits extending from the walls of each compartment are adapted to provide a current leakage path and efficient circulation of electrolyte solution through each compartment when the cell is immersed in a reaction tank containing electrolyte solution. Dimensionally stable anodes and cathodes in each compartment are generally foraminous sheet interleaved in horizontal position but may also be interleaved solid sheet disposed vertically or intermediate horizontal and vertical positions. The cell structure provides an excellent path for circulation of the electrolyte during electrolysis and minimizes electric current leakage between adjacent compartments. A process for the preparation of sodium chlorate is described.

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**3,819,504**

**METHOD OF MAINTAINING CATHODES OF AN ELECTROLYTIC CELL FREE OF DEPOSITS**

**John E. Bennett, Painesville, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio**

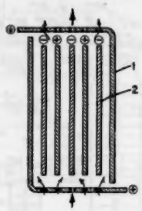
**Filed Apr. 28, 1972, Ser. No. 247,326**

**Int. Cl. C02b** *1/82*; **B01k** *3/04*

**U.S. Cl. 204—289** **2 Claims**

Cathodes of an electrolytic cell wherein a number of anodes and cathodes are positioned in spaced parallel relation in an electrolyte solution are maintained free of deposits which tend to form during electrolysis of the solution by contacting at

least one anode of said cell prior to contacting a cathode during the introduction of electrolyte solution to the cell and contacting at least one anode with the electrolyte solution subsequent to contacting the other electrodes just prior to removal of the solution from said cell.

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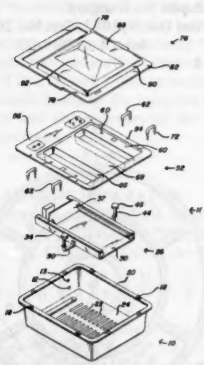
**3,819,505**

## TESTING APPARATUS

**Ronald A. Parent, Columbia, and John H. P. Andrews, Jr., Baltimore, both of Md., assignors to Becton, Dickinson and Company, East Rutherford, N.J.**

**Filed Mar. 9, 1972, Ser. No. 233,079**
**Int. Cl. B01k** *5/00*
**U.S. Cl. 204—299** **5 Claims**



A unit for retaining a disposable electrophoresis test kit adapted for detecting the presence of hepatitis associated antigen and the like includes a base, means for illuminating said test kit spaced within said base, a work platform for supporting the test kit, wherein the platform has at least one pair of electrodes oppositely disposed thereon and connected to said base for generating an electric potential across said test kit; a removable cover connected to said base for enclosing said unit, said cover having a transparent viewing port spaced therein for observing said test kit and an electrical circuit in said unit for supplying power to said illuminating means and said electrodes.

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**3,819,506**

## COAL DISSOLVING PROCESS

**Walter H. Seitzer, Chester, and Robert W. Shinn, Aston, both of Pa., assignors to Sun Research and Development Co., Philadelphia, Pa.**

**Filed Sept. 16, 1971, Ser. No. 181,229**
**Int. Cl. C10g** *1/04*
**U.S. Cl. 208—8** **3 Claims**

A process for dissolving sub-bituminous coal by heating a slurry of said coal in a hydrogenated anthracene oil in the presence of gaseous carbon monoxide, water, and hydrogen at a temperature of from about 400° to about 425°C. and at a total pressure of from about 2,000 to about 5,000 p.s.i.g.

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**3,819,507**

## DEHYDROCYCLIZATION OF PARAFFINS AND CATALYST THEREFOR

**Masayoshi Oishi, Wilmington, Del., assignor to Sun Research and Development Co., Philadelphia, Pa.**

**Filed June 15, 1972, Ser. No. 263,080**
**Int. Cl. C10g** *35/06*
**U.S. Cl. 208—139** **6 Claims**

Process of dehydrocyclizing $C_6$–$C_{10}$ hydrocarbons using a lithium, sodium or potassium zeolite X or a lithium, sodium or potassium zeolite Y which zeolite has been impregnated with from 0.10 to 1.2 wt. percent platinum and from 0.10 to 1.2 wt. percent rhenium and then reduced with hydrogen to the free metal. The dehydrocyclization reaction is carried out at from 500° to 560° C. and preferably from 510° to 555° C. using a partial pressure of hydrogen of from 10 to 300 p.s.i.g. and preferably from 50 to 200 p.s.i.g. to form benzene and alkylbenzenes.

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**3,819,508**

## METHOD OF PURIFYING LUBRICATING OILS

**Morton Fainman, 11200 Homedale, Los Angeles, Calif. 90049, and Charles Strouse McCauley, 9579 Casanes Ave., Downey, Calif. 90240**

**Filed June 4, 1973, Ser. No. 366,733**
**Int. Cl. C10g** *27/100*
**U.S. Cl. 208—180** **20 Claims**

A method of purifying used lubricating oils comprising the following steps:

1. Admixing the used lubricating oil with a mutually soluble predominantly hydrocarbon liquid diluent which preferably has a boiling range within the temperature region of about 100°F. to about 550°F.;
2. Admixing the diluted lubricating oil with a water miscible alcohol and water mixture containing a small amount of an ammonium or alkali metal base, and
3. Centrifuging to remove sludge and metal compounds from the oil and to separate the diluted oil phase from the alcohol-water phase to provide a purified organic layer having a low ash content.

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**3,819,509**

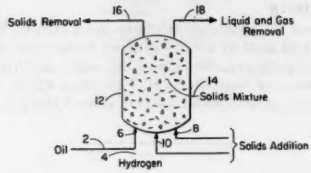
## LOW SULFUR FUEL OIL FROM HIGH METALS CONTAINING PETROLEUM RESIDUUM

**Ronald H. Wolk, Trenton, N.J., and William C. Rovesti, Levittown, Pa., assignors to Hydrocarbon Research, Inc., New York, N.Y.**

**Filed Nov. 26, 1971, Ser. No. 202,413**
**Int. Cl. C10g** *23/02*
**U.S. Cl. 208—216** **5 Claims**

The production of low sulfur fuel oil from a high metals containing Venezuelan petroleum residuum is improved when the reaction zone is operated with 40 to 60 volume percent of a

high surface area demetalization material and a 40 to 60 volume percent of a high activity hydrogenation catalyst with a limited porosity. Such an operation results in enhanced demetalization without a reduction in the desulfurization.

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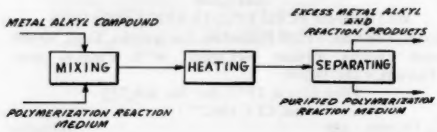
**3,819,510**

## METHOD FOR PRODUCING HIGH QUALITY POLYMERIZATION REACTION MEDIA

**Rusins Albertins, Naperville, and Michael A. Stasiewicz, Chicago, both of Ill., assignors to Standard Oil Company, Chicago, Ill.**

**Filed Sept. 21, 1972, Ser. No. 291,056**
**Int. Cl. C07c 11/00**
**U.S. Cl. 208—290** **15 Claims**




A process for producing high quality, polymerization-grade media comprising the steps of adding a metal alkyl compound to the polymerization media, holding the resulting mixture at a temperature greater than about ambient and less than about the critical temperature of the polymerization media for about 1 minute to about 180 minutes and finally substantially removing the reaction products and excess metal alkyl.

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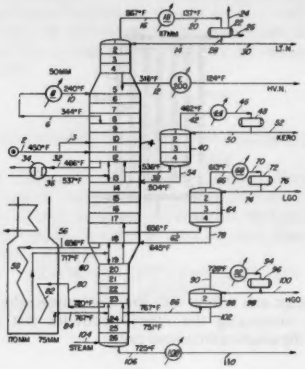
**3,819,511**

## DISTILLING A CRUDE OIL

**Alfred M. Peiser, Rocky Hill, and Matthew J. DePasquale, Yardley, both of Pa., assignors to Mobil Oil Corporation, New York, N.Y.**

**Filed Mar. 12, 1973, Ser. No. 340,498**
**Int. Cl. C10g 7/00**
**U.S. Cl. 208—353** **9 Claims**

An improved fractionating tower design with means for preheating the feed passed thereto is described which relies upon the concept of operating the tower primarily in a liquid loaded condition and particularly avoiding over-vaporization of any selected fraction withdrawn from the tower for a product stream. In conjunction therewith preheating of the feed is kept to a minimum and the preheated feed is introduced to an upper portion of the tower wherein it will best promote the above identified operating concepts. Vaporous product fractions are separated from the tower and recovered in adjacent rectifying zones.

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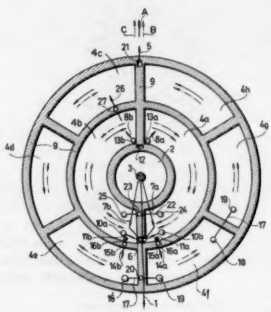
**3,819,512**

## PURIFICATION OF EFFLUENT CONTAINING ORGANIC MATTER

**Istvan Praznovsky, and Imre Gyulavari, both of Debrecen, Hungary, assignors to Nikex Nehezipari Kulkereskedelmi Vallalat, Budapest V., Hungary**

**Filed Dec. 9, 1971, Ser. No. 206,381**
**Int. Cl. C02c 1/02**
**U.S. Cl. 210—8** **11 Claims**



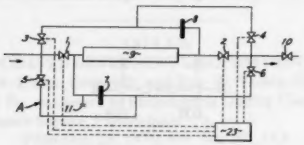
Domestic and/or industrial effluent containing biodegradable organic impurities is passed consecutively through an auxiliary stabilizing tank and an aerobic stabilizing tank, in the latter of which the effluent is subjected to oxidation by oxygen produced by photosynthesis. A portion of the effluent is recycled from the aerobic stabilizing tank to the auxiliary stabilizing tank. A preferred region from which the effluent is to be recycled and a preferred period during which effluent is to be recycled are given.

3,819,513

## AUTOMATIC CLEANING ARRANGEMENT FOR ELONGATED TUBULAR OBJECTS

Kiyoshi Ishii; Syobu Konomi, both of Saitama, and Yoshio Ishiguro, Tokyo, all of Japan, assignors to Daicel Ltd., Osaka, Japan

Filed Aug. 21, 1972, Ser. No. 282,449
Claims priority, application Japan, Aug. 26, 1971, 46-65385
Int. Cl. B01d 31/00
U.S. Cl. 210—23 9 Claims



Two or more screens are located within a piping system and a sponge ball or balls are disposed in the system for movement back and forth between the screens. By switching valves installed in the piping system, the sponge ball or balls are automatically and intermittently moved back and forth to clean the piping system.

3,819,514

## OIL SPILL RECOVERY

Bert H. Clampitt, Overland Park; Kenneth E. Harwell, Merriam, and Joseph W. Jones, Jr., Leawood, all of Kans., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Sept. 24, 1971, Ser. No. 183,574
Int. Cl. B01d 15/00
U.S. Cl. 210—40 6 Claims

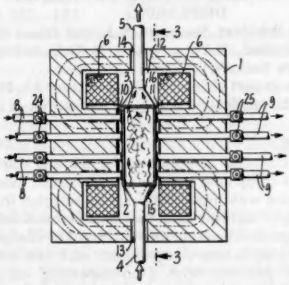
An article of manufacture for use in the removal and recovery of oil slicks or spills floating on the surfaces of bodies of water consisting essentially of a foam of an ethylene-alkyl acrylate copolymer having a melt index of at least 800, preferably an ethylene copolymer containing from about 10 up to about 45 weight percent methyl acrylate having a melt index in the range of from about 1,000 up to about 2,000 and a process for using such foams in the selective removal of oil from water surfaces and the recovery of the absorbed oils from said foams is disclosed.

3,819,515

## MAGNETIC SEPARATOR

James W. Allen, 8 Dover Ct., Orinda, Calif. 94563

Filed Aug. 28, 1972, Ser. No. 284,266
Int. Cl. B01d 35/06
U.S. Cl. 210—42 14 Claims



A magnetic separator for kaolin clay brightening comprising: a ferromagnetic housing; a vertically elongated rectangular canister enclosed within the housing, said canister being filled with a stainless steel wool matrix and having a slurry inlet at its bottom and a slurry outlet at its top; a pair of electromagnetic coils flanking opposed vertical sides of the canister which generate a magnetic field horizontally across the shortest dimension of the canister; and a plurality of wash water inlets and outlets in said opposed vertical sides of the canister for periodically cross flushing the matrix to regenerate it.

3,819,516

## TREATMENT OF AQUEOUS SOLUTIONS CONTAMINATED WITH SOLUBLE ORGANIC MATERIALS

Craig B. Murchison; Robert E. Bailey, and Ronald W. Diesen, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 9, 1973, Ser. No. 349,518
Int. Cl. C02b 3/08
U.S. Cl. 210—63 9 Claims

An aqueous liquor containing oxidizable organic materials is treated in the following manner to oxidize the organics. There is provided in solution, in the organically polluted aqueous liquor, a catalytic quantity of iron ions. The pH of the aqueous liquor is adjusted to 4 or below and then treated with oxygen and light energy having a wave length of 5800 A or less. The principle products of the oxidation process are $CO_2$, water and lower molecular weight organics.

3,819,517

## FIRE RETARDANT COMPOSITIONS

Antonio M. Cavazos, Carrolton, and Donald W. Kelley, Garland, both of Tex., assignors to Thuron Industries, Inc., Dallas, Tex.

Filed July 3, 1972, Ser. No. 268,617
Int. Cl. C09k 3/28
U.S. Cl. 252—8.1 10 Claims

Compositions which impart the properties of fire proofing and dirt and dust pick up for natural and synthetic fibrous materials comprising a puffed alkali metal borate of low density, an ammonium salt and an oil, said compositions providing a one step method for imparting said properties.

3,819,518

## SCORCH-RESISTANT WATER-SOLUBLE FLAME-RETARDANTS FOR CELLULOSE

Abraham S. Endler, Flushing, N.Y., assignor to Apex Chemical Co., Inc., Elizabethport, N.J.

Filed July 31, 1972, Ser. No. 276,888
Int. Cl. C09k 3/28
U.S. Cl. 252—8.1 4 Claims

Cellulosic materials are made flame retardant, while minimizing the scorching and loss of strength of such materials when heated, by applying thereto a composition, preferably in aqueous solution, consisting essentially of at least one sodium or potassium salt of orthophosphoric acid or the various polymeric phosphoric acids, and at least one guanidine, guanylurea or biguanide salt of hydrochloric, hydrobromic, sulfuric, sulfamic or phosphoric acid, with the proportion, by weight, of the sodium or potassium salt to the guanidine, guanylurea or biguanide salt being in the range from 1:5 to 5:1, and with the total dry add-on of the composition being from 5 to 30 percent of the weight of the cellulosic material being treated therewith. The guanidine, guanylurea or biguanide salt constituent of the flame retardant composition may be provided in the form of the product of the condensation reaction of dicyandiamide with at least one of ammonium chloride, bromide, sulfamate or sulfate.

3,819,519

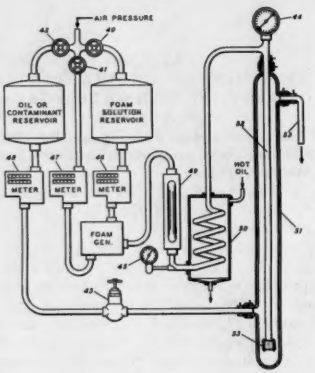
## FOAM CIRCULATION FLUIDS

Samuel H. Sharman, Kensington; Ralph House, San Pablo, and Glen W. Anderson, Oildale, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 779,519, Nov. 27, 1968, abandoned. This application June 8, 1972, Ser. No. 260,930

Int. Cl. E21b *21/04*; E21c *7/06*

U.S. Cl. 252—8.5 C 13 Claims




Detergent-range olefin sulfonates containing a minor amount of $C_9$–$C_{15}$ substantially linear primary alcohols yield aqueous gas-in-liquid foams having exceptionally low resistance to flow. These foams are especially effective circulation fluids in oil wells when for each 100 parts of the sulfonate from 10 to 25 parts of the alcohol is present in the foaming agent mixture.

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3,819,520

## MIXED ALCOHOLS IN WELL ACIDIZING

Loyd W. Jones, and George B. Holman, Jr., both of Tulsa, Okla., assignors to Amoco Production Company, Tulsa, Okla.

Filed Apr. 10, 1972, Ser. No. 242,476

Int. Cl. E21b *43/27*

U.S. Cl. 252—8.55 C 6 Claims

A mixture of an octanol and a lower alcohol is used with, ahead of, or behind aqueous acid solutions employed to acidize wells.

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3,819,521

## LUBRICANT CONTAINING DISPERSED BORATE AND A POLYOL

Marc J. Sims, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed June 7, 1971, Ser. No. 150,760

Int. Cl. C10m *1/40*, *1/22*, *1/10*

U.S. Cl. 252—18 23 Claims

A novel lubricant composition is disclosed, having superioer EP and water tolerance properties, which comprises a nonpolar lubricating oil and minor amounts each of sodium borate, a lipophilic surface-active agent, and a $C_3$–$C_6$ polyol containing 2 to 6 hydroxyl groups, including at least 1 hydroxyl group pair separated by at least three carbon atoms.

3,819,522

## ANTI-FOGGING WINDOW CLEANER SURFACTANT MIXTURE

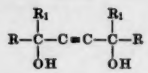
Barney J. Zmoda, Bridgewater, and Raymond S. Brown, Iselin, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Sept. 25, 1972, Ser. No. 291,681

Int. Cl. C11d *1/72*

U.S. Cl. 252—89 20 Claims

An anti-fogging surfactant mixture for use in a window cleaning composition consisting essentially of a mixture of a nonionic surface active agent having the formula



wherein R is an alkyl group having from one to four carbon atoms and $R_1$ is a radical selected from the group consisting of methyl, ethyl, cyclopropyl, and phenyl or the reaction product of the above glycol and from 2 to 200 moles of ethylene oxide and an anionic or nonionic surfactant in a weight ratio of 1:50 to 1:1. A non-fogging window cleaner containing from 0.1 to 3 percent of the above noted anti-fogging surfactant mixture as well as a method for utilizing the same is provided.

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3,819,523

## COMPOSITION FOR CLEANING ADHERING HARDENED CONCRETE AND FOR STRIPPING CONCRETE AND PLASTER

Fred Bove, Warken, Luxembourg, assignor to Importec Technical Improvement S.A., Friboug, Switzerland

Filed Nov. 6, 1972, Ser. No. 303,943

Int. Cl. C11d *15/04*

U.S. Cl. 252—89 2 Claims

This invention relates to a composition for cleaning adhering hardened concrete and for stripping concrete and plaster. The composition comprises mineral oil and/or hydrocarbon and contains at least one glyceride. The improvement consists in that the latter contains, in addition a wetting agent derived from plant or animal fats, such as saponin, lecithin, glycinin, phytosterin and rosin.

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3,819,524

## COSMETIC COMPOSITION FOR THERMAL DISPENSING

Warren Robert Schubert, Somerset, N.J., and James Richard Marshall, Pittsford, N.Y., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 834,144, June 17, 1969, abandoned. This application Dec. 7, 1972, Ser. No. 311,721

Int. Cl. C11d *9/42*

U.S. Cl. 252—90 2 Claims

An aqueous cosmetic composition for thermal dispensing containing (a) a compound capable of exothermic oxidation-reduction reaction with hydrogen peroxide selected from the group consisting of ascorbic acid, its salts and esters and (b) a metal salt catalyst to accelerate the reaction. The composition may be pressurized in one compartment of a two compartment container provided with a co-dispensing valve with hydrogen peroxide in the other compartment so that, upon actuation of valve, the liquids from the two compartments are thoroughly mixed as they are discharged. react and release the heat of reaction to warm the discharged product.

3,819,525
COSMETIC CLEANSING PREPARATION
David L. Hattenbrun, New Hampton, N.Y., assignor to Avon Products, Inc., Suffern, N.Y.
Filed Aug. 21, 1972, Ser. No. 282,072
Int. Cl. C11d 9/26; B08b 7/00
U.S. Cl. 252—132 4 Claims

A cleansing composition comprising a soap or detergent base in which substantially completely hydrolyzed water-soluble polyvinyl alcohol particles are uniformly dispersed therein to form a composition which imparts a mild abrasive action found especially useful in cleansing the skin.

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3,819,526
COATED DETERGENT COMPOSITIONS
Richard H. Pierce, Broomall, and Eric W. Vessey, Springfield, both of Pa., assignors to Philadelphia Quartz Company, Independence Square, Philadelphia, Pa.
Filed Dec. 23, 1970, Ser. No. 101,163
Int. Cl. C11d 3/08, 3/30, 17/06
U.S. Cl. 252—135 5 Claims

This invention involves a process for making an improved detergent composition. In practice it consists in spraying a slurry of some ingredients of the composition on to other ingredients which have been pre-dried. Specifically, a hydrous alkali metal silicate or hydrous blend of silicate and other alkaline component is coated with a solution or slurry of other ingredients and then the composite is dried to give a free-flowing detergent. The resulting composition is very stable, containing a very low concentration of insoluble material. It also resists formation of insoluble material on storage.

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3,819,527
COMPOSITION AND METHOD FOR INHIBITING ACID ATTACK OF METALS
Edgar S. Hayman, Jr., New Hope, Pa., assignor to Amchem Products, Inc., Ambler, Pa.
Filed Nov. 6, 1972, Ser. No. 303,956
Int. Cl. C11d 7/34
U.S. Cl. 252—149 18 Claims

A composition comprising a cyclic trimer of methylene ortho-toluidine, thiourea, and a sulfonium salt for use in an acidic aqueous composition for the purpose of inhibiting acid attack on metallic surfaces which are contacted with the acidic composition.

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3,819,528
STABILIZED AQUEOUS ENZYME COMPOSITIONS
Jim S. Berry, Springfield Twsp., Hamilton County, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Continuation of Ser. No. 786,432, Dec. 23, 1968, abandoned.
This application Mar. 6, 1972, Ser. No. 232,300
Int. Cl. C07g 7/02; C11d 7/42, 7/50
U.S. Cl. 252—153 19 Claims

Aqueous amylolytic enzyme-containing compositions comprising water, amylolytic enzyme, a water-soluble calcium salt, an organic co-stabilizing agent selected from aliphatic glycols and 1,3-propanediol and, optionally, a nonionic or zwitterionic detergent are disclosed. The compositions, useful as starch-degrading compositions, are stabilized substantially against loss of amylolytic enzyme activity during storage.

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3,819,529
IMIDAZOLE STRIPPING COMPOSITION AND METHOD
Donald P. Murphy, Madison Heights, Mich., assignor to Oxy Metal Finishing Corporation, Warren, Mich.
Filed Jan. 17, 1973, Ser. No. 324,277
Int. Cl. C11d 7/06, 7/12, 7/14, 7/16, 7/32
U.S. Cl. 252—156 5 Claims

Disclosed is a method and composition useful for stripping organic coatings. The stripping composition is phenol-free and contains an alkyl or aryl substituted imidazole in an aqueous alkaline solution and stripping is effected by contacting the surface with the solution.

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3,819,530
STABILIZED WAX EMULSIONS
Edward L. Ratledge, Claymont Heights, Del., and Richard E. Ware, Trainer, Pa., assignors to Sun Oil Company, Philadelphia, Pa.
Filed July 15, 1968, Ser. No. 744,705
Int. Cl. B01j 13/00
U.S. Cl. 252—311.5 1 Claim

Wax-in-water emulsion compositions containing 0.05 to 10 percent of a stability improving compound of the structural formula:

wherein N and N′ are substituents each selected from the group consisting of $-NH_2$, $-NHCH_3$, $-NHC_2H_5$, $-CH_3$, $-C_2H$ and to the methods of preparing said compositions.

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3,819,531
LIQUID CRYSTAL COMPOSITIONS
Franklin D. Saeva, Fairport, and Richard L. Schank, Webster, both of N.Y., assignors to Xerox Corporation, Rochester, N.Y.
Filed Feb. 24, 1972, Ser. No. 228,958
Int. Cl. G01n 33/00
U.S. Cl. 252—408 1 Claim

Liquid crystalline compositions having the optical properties of the cholesteric mesophase are disclosed. The compositions comprise at least one nematic liquid crystalline material and at least one potentially cholesteric material which has a molecular structure which is similar to that of a nematic liquid crystal. Uses of the novel compositions are also described.

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3,819,532
GRAPHITE PELLETS
John Roland Cracknell, Esher, and Aleksander Jerzy Groszek, London, both of England, assignors to The British Petroleum Company Limited, London, England
Filed Dec. 14, 1970, Ser. No. 98,029
Claims priority, application Great Britain, Dec. 19, 1969, 61922/69
Int. Cl. C10g 25/00
U.S. Cl. 252—447 3 Claims

Air or gas ground graphite is formed into pellets by mixing with finely divided alumina, forming into a paste and then granulating or extruding. The pellets so formed can be used as air or gas ground graphite but with the advantage that the pellets can be in the form of a fixed bed. A typical application is a polishing treatment for lubricating oils to remove aromatics, heterocyclics, sulphur compounds and coloured materials.

3,819,533

## CATALYST FOR THE ELIMINATION OF POLLUTANTS IN EXHAUST GASES; CATALYST RESISTANT TO SULFUR POISONING; CATALYST CONTAINING AN EVEN DISTRIBUTION OF PROMOTERS

**Robert Henry Whitman, Stamford, Conn., and Edward Leyman, New Rochelle, N.Y., assignors to American Cyanamid Company, Stamford, Conn.**

**Filed May 18, 1972, Ser. No. 254,590**

**Int. Cl. B01j** *11/40, 11/06, 11/32*

**U.S. Cl. 252—455 R** **9 Claims**

An improved catalyst for oxidation of exhaust gases emanating from internal combustion engines which consists of a stabilized alumina support containing a uniform distribution of cupric oxide and chromic oxide as a first promoter level and thereover palladium as a second promoter level as well as the process for manufacture and use thereof are disclosed.

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3,819,534

## CATALYST FOR ELIMINATION OF POLLUTANTS IN AUTO-EXHAUST GAS

**Robert Henry Whitman, Stamford, Conn., and Louis Leonard Lento, Jr., Saddle River, N.J., assignors to American Cyanamid Company, Stamford, Conn.**

**Filed May 18, 1972, Ser. No. 254,593**

**Int. Cl. B01j** *11/32, 11/00*

**U.S. Cl. 252—457** **9 Claims**

There is disclosed a catalyst composition comprising a support material upon which is deposited an alkaline earth metal oxide, chromium trioxide, and copper oxide in proportions which achieve desirable conversion temperatures and catalyst stability for use in a catalytic muffler for auto-exhaust gases. The method of catalyst preparation is also disclosed.

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3,819,535

## CATALYST FOR OXIDATION OF HYDROCARBONS AND CARBON MONOXIDE

**Francis Huba, Painesville, and Irving Malkin, University Heights, both of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio**

**Filed Apr. 13, 1972, Ser. No. 243,823**

**Int. Cl. B01j** *11/06, 11/22*

**U.S. Cl. 252—462** **7 Claims**

An improved catalyst for oxidation of hydrocarbons and carbon monoxide can be obtained by depositing a layer of copper oxide and then a layer of cerium oxide as catalysts on an alumina support which has been stabilized against shrinkage. When a preformed alumina support is used, the support can be stabilized against shrinkage by soaking the support in a solution of a barium salt and heat treating prior to depositing the copper oxide layer. An alumina support, which is stable against shrinkage, can be prepared by treating alumina powder with a solution of chromic acid and a barium or magnesium salt to form spheres which are then dried and heat treated.

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3,819,536

## PROCESS FOR PREPARING A CATALYST BASED ON RUTHENIUM

**Ralph A. Dalla Betta, Southfield; Haren S. Gandhi, Dearborn Heights; Joseph T. Kummer, Ann Arbor, and Mordecai Shelef, Southfield, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.**

**Filed Dec. 26, 1972, Ser. No. 318,339**

**Int. Cl. B01j** *11/08*

**U.S. Cl. 252—462** **12 Claims**

A process is taught for producing a ruthenium catalyst. A fixing compound, selected from alkaline earth materials or rare earth materials which decompose to an oxide of the material, is deposited on a catalytic support. A hydrated, halogenated ruthenium compound which reduces to ruthenium is also deposited on the catalytic support. The materials on the support are heated in a reducing atmosphere to form the ruthenium metal. After the reducing step the materials are fixed by heating them to a ruthenate forming temperature. The product produced in this manner is desirable for use in the catalytic conversion, in a reducing atmosphere, of oxides of nitrogen. The ruthenium catalyst of the product produced by this method is resistant to volatilization when exposed to an oxidizing ambient.

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3,819,537

## CATALYTIC ALLOY OF SILVER AND TIN FOR THE PRODUCTION OF ETHYLENE OXIDE FROM ETHYLENE

**Pierre Edouard Chan, Geneva, Switzerland, assignor to Montecatini Edison S.P.A., Milan, Italy**

**Filed Aug. 18, 1971, Ser. No. 172,896**

**Claims priority, application Switzerland, Sept. 16, 1970, 13716/70**

**Int. Cl. B01j** *11/08*

**U.S. Cl. 252—476** **1 Claim**

A catalyst for the production of ethylene oxide by oxidation of ethylene with oxygen, comprising a composition of silver and tin, having a tin content corresponding to an amount of between $5.10^{-5}$ (0.005 percent) and $5.10^{-2}$ (5 percent) by weight of the silver.

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3,819,538

## ENVIRONMENTALLY COMPATIBLE LAUNDRY DETERGENT

**John C. Little, Danville, Calif.; Arthur S. Teot, and Robert F. Harris, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.**

**Filed May 15, 1972, Ser. No. 253,326**

**Int. Cl. C11d** *3/075, 3/30, 3/08*

**U.S. Cl. 252—527** **16 Claims**

Laundry detergents wherein the active surfactant ingredients have the formula

$$RO-(CH_2CH_2O)_n-(CH_2)_x-CHR'COOM$$

wherein R is a hydrocarbon radical of about 12–22 carbon atoms, R' is H or lower alkyl, n is an integer of 1 to about 8, $x$ is 0 or 1 and M is an alkali metal, amine or ammonium radical, are highly effective and are readily biodegradable. The active ingredients are especially responsive to nonphosphate builders.

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3,819,539

## PROCESS FOR PREPARING DETERGENT COMPOSITIONS

**Michael Bloch, Salmuenster, Germany, and Adolph Koebner, Cumberland, England, assignors to Rewo Chemische Fabrik G.m.b.H. Steinau, Kreis Schluechtern, Germany**

**Filed Dec. 21, 1971, Ser. No. 210,545**

**Claims priority, application Germany, Dec. 23, 1970, 2063422**

**Int. Cl. C11d** *3/26*

**U.S. Cl. 252—547** **5 Claims**

The invention provides a process of preparing a substantially non-irritant, essentially tertiary amine-free detergent mixture comprising as the active constituents a quaternized tertiary amine and the corresponding tertiary amine N-oxide, in which process a tertiary amine is reacted with a quaternizing agent, to produce a mixture of the free tertiary amine and the quaternized tertiary amine, and this mixture is then subjected to oxidation, thereby converting the free tertiary amine to the amine oxide, and giving the required essentially tertiary amine-free detergent composition.

## 3,819,540
## SULFONATE DETERGENTS

**Stanley C. Paviak, Shaler Twp., Allegheny County, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.**

**Filed July 6, 1971, Ser. No. 160,210**
**Int. Cl. C11d 1/14**
**U.S. Cl. 252—555** **5 Claims**

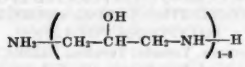
An aqueous composition of matter containing sodium alkene sulfonates or sodium hydroxy alkane sulfonates and a partially or fully neutralized copolymer of methyl vinyl ether and maleic anhydride in an amount sufficient to increase the viscosity thereof.

## 3,819,541
## POLYALKANOLAMINE RESINS

**Juan Longoria, III, and John A. Cook, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.**

**Filed Apr. 27, 1973, Ser. No. 355,253**
**Int. Cl. C08g 33/02, 33/06**
**U.S. Cl. 260—2 BP** **5 Claims**

A novel process is herein described for making thermosetting cationic water-soluble resins having improved properties. It comprises reacting (a) a polypropanolamine corresponding to the formula



with (b) epichlorohydrin. The process is conducted in an agitated aqueous medium at a temperature of from about 40°—80°C. The polyalkanolamine resins thus formed are wet-strength additives for paper.

## 3,819,542
## METHOD OF MAKING HIGH OPACITY RESIN POROUS FILMS AND AQUEOUS LATEX FOR PRODUCING SAID FILMS

**Robert W. Kreider, St. Charles, Ill., assignor to DeSoto, Inc., Des Plaines, Ill.**

**Filed Mar. 30, 1972, Ser. No. 239,719**
**Int. Cl. C08f 45/24; C08j 1/14**
**U.S. Cl. 260—2.5 M** **15 Claims**

An aqueous latex coating composition adapted to deposit films which dry to form a cellular layer of high opacity is provided by swelling the resin particles of the aqueous latex with a primary organic solvent which is essentially immiscible in the aqueous phase of the latex, such as xylene, and by introducing into the aqueous phase an at least partially water miscible organic solvent, such as propylene glycol, having a lower evaporation rate and a lesser capacity for solvating the resin of the latex than said primary solvent. When the primary solvent evaporates, a cellular film is formed with the secondary solvent serving to increase the opacification which is obtained.

## 3,819,543
## PRODUCTION OF CHLORINATED POLYETHYLENE FOAMS

**Fritz Stastny, Ludwigshafen; Hans-Georg Trieschmann, Hambach; Rudolf Gaeth, Limburgeshof; Gerhard Zeitler, Hessheim, and Boris Ikert, Manheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen/Rehin, Germany**

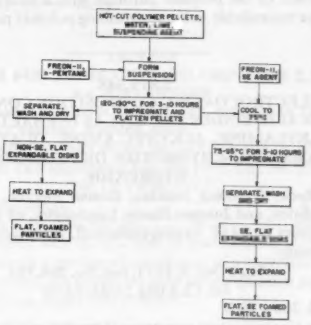
**Continuation of Ser. No. 845,520, July 28, 1969, abandoned. This application Sept. 18, 1972, Ser. No. 290,136**
**Claims priority, application Germany, Aug. 27, 1968, 1769861**
**Int. Cl. C08f 47/10, 29/04**
**U.S. Cl. 260—2.5 HA** **7 Claims**

Production of chlorinated polyethylene foams by heating a mixture of chlorinated polyethylene, a crosslinking agent and an expanding agent. The foams, which are flexible and self-extinguishing may be used for example as insulating material, upholstery padding and packaging components.

## 3,819,544
## FOAMED PARTICLES FOR LOOSE FILL PACKAGING

**Walter O. Pillar, Monroeville, and Timothy Altares, Jr., Valencia, both of Pa., assignors to Arco Polymers, Inc., Pittsburgh, Pa.**

**Filed Feb. 23, 1973, Ser. No. 335,044**
**Int. Cl. C08j 1/26**
**U.S. Cl. 260—2.5 B** **5 Claims**


HOT-CUT POLYMER PELLETS, WATER, LIME SUSPENDING AGENT
FREON-11, n-PENTANE
FORM SUSPENSION
FREON-11, SE AGENT
SEPARATE, WASH AND DRY
120-130°C FOR 3-10 HOURS TO IMPREGNATE AND FLATTEN PELLETS
COOL TO 75°C
NON-SE, FLAT EXPANDABLE DISKS
75-95°C FOR 3-10 HOURS TO IMPREGNATE
HEAT TO EXPAND
SEPARATE, WASH AND DRY
FLAT, FOAMED PARTICLES
SE, FLAT EXPANDABLE DISKS
HEAT TO EXPAND
FLAT, SE FOAMED PARTICLES

Foamed, self-extinguishing particles of styrene polymers and copolymers are prepared by subjecting hot-cut pellets having little or no internal stresses to a two-stage process comprising a pellet flattening stage and a self-extinguishing agent stage. The resulting flat disks can be expanded by steam to form flat, self-extinguishing particles having a mixture of shapes ranging from circular to oval and having a flatness index of between 2.0 and 9.0. The particles are especially suitable for use in the loose-fill packaging of sensitive or fragile articles.

## 3,819,545
## FOAMABLE COMPOSITION COMPRISING A GAS-EXPANDABLE POLYMERIC MATERIAL AND OXALYL CARBAZATE OR OLIGOMERS THEREOF, AND METHOD OF FORMING SAME

**Byron A. Hunter, Woodbridge, Conn., assignor to Uniroyal, Inc., New York, N.Y.**

**Filed Apr. 26, 1973, Ser. No. 354,586**
**Int. Cl. C08j 1/18, 1/20, 1/22**
**U.S. Cl. 260—2.5 R** **10 Claims**

Certain oxalyl carbazates are useful as blowing agents for polymers. Some of these carbazates are new compounds.

3,819,546

## ANTILUMPING EXPANDABLE STYRENE POLYMERS

Timothy Altares, Jr., Valencia, Pa., assignor to Arco Polymers, Inc., Pittsburgh, Pa.

Filed May 9, 1973, Ser. No. 358,531
Int. Cl. C08j 1/26; B44d 5/00
U.S. Cl. 260—2.5 B 2 Claims

Expandable styrene polymer particles are surface-coated with poly(methyl methacrylate) to prevent the particles from lumping together during expansion. The coating is applied by adding 0.03–0.30 part of poly(methyl methacrylate) to an aqueous suspension of tricalcium phosphate prior to the addition of 100 parts of polymer particles and prior to impregnating the mixture with a blowing agent.

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3,819,547

## SELF-EXTINGUISHING POLYMER COMPOSITIONS CONTAINING HEXABROMO-2-BUTENE

Walter O. Pillar, Monroeville, and Robert A. Sutton, Coraopolis, both of Pa., assignors to Arco Polymers, Inc., Pittsburgh, Pa.

Filed July 9, 1973, Ser. No. 377,705
Int. Cl. C07c 21/02; C08f 1/26
U.S. Cl. 260—2.5 FP 11 Claims

Expandable styrene polymer compositions are made self-extinguishing by incorporating from 0.2 to 10 percent by weight of hexabromo-2-butene, with or without a peroxide synergist, into the polymer. The preferred method of incorporation comprises adding the hexabromobutene during impregnation of the polymer particles with a blowing agent to produce expandable, self-extinguishing polymer particles.

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3,819,548

## AN ELECTROCOATING COMPOSITION CONTAINING AN ACID BINDER PRESENT AS THE SALT OF AN ARYLAMINE, ALKYNYL AMINE, QUATERNARY AMMONIUM HYDROXIDE OR PHOSPHONIUM HYDROXIDE

Fritz Beck; Guenther Sabelus; Roman Fischer, all of Ludwigshafen, and Juergen Haufe, Lambsheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen/Rhein, Germany

Filed Dec. 3, 1971, Ser. No. 204,701
Int. Cl. C08g 51/44, 51/50
U.S. Cl. 260—18 R 15 Claims

In an electrocoating process acid binders which are present at least partly in the form of their salts with basic compounds are used and the basic compounds used for salt formation consist of the extent of 0.1 to 50 percent of the neutralization equivalent of the acid binder of at least one arylamine and/or alkynylamine and/or quaternary ammonium hydroxide and/or phosphonium hydroxide with at least one aromatic ligand, and other conventional additives and non-basic corrosion inhibitors may be contained in the aqueous solution or dispersion of the coating composition. The process is suitable for the production of particularly corrosion-resistant coatings on metal articles.

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3,819,549

## ROOM TEMPERATURE VULCANIZING ORGANOSILICONE COMPOSITIONS

Kiyoshi Imai, and Hiroshi Inomata, both of Annaka, Japan, assignors to Shinetsu Chemical Company, Tokyo, Japan

Filed Feb. 2, 1973, Ser. No. 329,051
Claims priority, application Japan, Feb. 4, 1972, 47-012639
Int. Cl. C08g 51/72
U.S. Cl. 260—18 S 12 Claims

Room temperature vulcanizing compositions are provided which comprise, by weight, 100 parts of hydroxyl-endblocked diorganopolysiloxane, from 0.1 to 20 parts of alkoxysilane or alkoxysiloxane having three or more functional groups, from 0.3 to 10 parts of glycerophosphoric acid or a metallic salt thereof, and from 0.05 to 5 parts of a metallic salt of an organic carboxylic acid. Curing can take place for the entire body of the composition inclusive of parts exposed to air. Even the inside of the body can be cured at the same rate, so as to produce cured rubber having superior hardness, elongation and tensile strength.

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3,819,550

## INTUMESCENT COMPOSITION, FOAMED PRODUCT PREPARED THEREWITH AND PROCESS FOR MAKING SAME

Salvatore R. Riccitiello, San Jose, and John A. Parker, Los Altos, both of Calif., assignors to The United States of America as represented by the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 140,946, May 6, 1971, Pat. No. 3,730,891.
This application Dec. 26, 1972, Ser. No. 318,358
Int. Cl. C08g 53/08
U.S. Cl. 260—2.5 FP 10 Claims

An intumescent composition and the foamed product prepared by heating the composition are provided wherein the composition comprises the reaction product of para-benzoquinone dioxime and a concentrated mineral acid such as sulfuric acid, phosphoric acid, and polyphosphoric acid. The composition is useful as an intumescent agent either by itself or when combined with other materials. A fire-resistant and heat-insulating composition is provided by heating the intumescent composition above its intumescent temperature.

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3,819,551

## METHOD FOR CURING UNSATURATED EPOXY-ESTER RESINOUS COMPOSITIONS USING AN ORGANIC IMIDE TO CONTROL POT-LIFE

Sadakazu Hokamura, Yamato; Teruhisa Akaoka, and Toshiaki Hanyuda, both of Yokohama, all of Japan, assignors to Showa High Polymer Co., Ltd., Tokyo, Japan

Filed Jan. 26, 1972, Ser. No. 221,101
Claims priority, application Japan, Jan. 27, 1971, 46-2386
Int. Cl. C08g 30/10
U.S. Cl. 260—23 EP 2 Claims

This invention relates to an improvement of a method for curing unsaturated epoxy-ester resinous compositions and the improvement is achieved by using (1) one or more organic peroxides together with (2) one or more organic metal salts and (3) one or more organic imide compounds which are incorporated with the unsaturated epoxy-ester resinous compositions.

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3,819,552

## ADHESIVE COMPOSITION

Lewis Malcolm Glanville, Southampton, and Anthony F. M. Dunkley, Winchester, both of England, assignors to The International Synthetic Rubber Company Limited, Southampton, England

Filed Oct. 20, 1972, Ser. No. 299,233
Claims priority, application Great Britain, Oct. 22, 1971, 49290/71
Int. Cl. C08f 29/10
U.S. Cl. 260—27 BB 6 Claims

An adhesive composition comprises chlorobutyl rubber, an unsaturated ethylene-alpha olefin polymer of high molecular weight (as defined), carbon black, a liquid isobutene polymer, an ethylene alpha-olefin copolymer of low molecular weight (as defined), a tackifying resin and a sulphur vulcanisation system, each component being present in specified proportions. The adhesive composition is particularly useful in the preparation of an article of manufacture comprising at least

two sheets of vulcanised EPDM rubber compositions, the edge portion of the sheets being adhered together at the interface by means of the adhesive composition which has been vulcanised after bringing said edges together.

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3,819,553

## STABILIZED THERMOPLASTIC POLYURETHANE COMPOSITION

**Roger W. Stephens; Christiaan Vervloet, and Hugo C. W. Monnee, all of Delft, Netherlands, assignors to Shell Oil Company, Houston, Tex.**

**Filed July 13, 1972, Ser. No. 271,331**

**Claims priority, application Great Britain, Mar. 17, 1972, 12653/72**

**Int. Cl. C08g** *51/60*

**U.S. Cl. 260—28** **11 Claims**

Heat stabilized thermoplastic polyurethane rubber compositions comprise: (1) a thermoplastic polyurethane rubber together with small amounts each of (2) certain organic di-isocyanate dimers and (3) at least one inhibitor for the cross-linking of said polyurethane rubber.

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3,819,554

## READILY PROCESSABLE ESSENTIALLY RIGID VINYL CHLORIDE POLYMER COMPOSITIONS

**Robert R. Blanchard, Port Allen, La., assignor to The Dow Chemical Company, Midland, Mich.**

**Continuation of Ser. No. 162,681, July 14, 1971, abandoned, which is a continuation-in-part of Ser. No. 824,320, May 13, 1969, abandoned, which is a continuation-in-part of Ser. No. 684,938, Nov. 22, 1967, abandoned, which is a continuation-in-part of Ser. No. 373,086, June 5, 1964, abandoned. This application Aug. 6, 1973, Ser. No. 386,244**

**Int. Cl. C08f** *45/52, 19/18, 29/18*

**U.S. Cl. 260—28.5 D** **3 Claims**

This invention pertains to essentially rigid vinyl chloride polymer compositions which are easily fabricated into articles such as extrusion blown bottles having exceptional clarity and surface smoothness. More particularly, the invention relates to rigid or essentially rigid thermoplastic compositions comprised essentially of 100 parts by weight of a vinyl chloride polymer in intimate admixture with between about 0.25 and 35 parts by weight of certain chlorinated polyethylenes and between about 0.2 and 0.7 part per 100 parts of a polyethylene having an average molecular weight of between about 1,500 and 15,000.

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3,819,555

## VINYLAMIDE-ACROLEIN POLYMERS AND PAPER OF IMPROVED STRENGTH HAVING A CONTENT THEREOF

**Ernest D. Kaufman, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.**

**Filed Dec. 23, 1971, Ser. No. 211,633**

**Int. Cl. C08g** *9/20, 51/24*

**U.S. Cl. 260—29.4 UA** **7 Claims**

Polymers consisting essentially of a major proportion of vinylamide linkages and a minor proportion of acrolein linkages are self-substantive to cellulose fibers in aqueous suspension and provide good dry strength. If desired, the polymers may carry anionic substituents, cationic substituents, or both, in which event the affinity of the polymers for the cellulose fibers is improved. Furthermore, if desired, the polymers may contain thermosetting substituents in which event the polymer possesses wet-strengthening properties in addition to providing dry strength. The polymers are specially useful in the manufacture of paper from unbleached fibers and from pulps which contain black liquor.

3,819,556

## CORROSION RESISTANT PROCESSING

**Takao Morisawa, Yokkaichi, Japan, assignor to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan**

**Filed Aug. 22, 1972, Ser. No. 282,776**

**Claims priority, application Japan, Sept. 30, 1971, 46-76523**

**Int. Cl. C08f** *19/10, 41/06, 45/04*

**U.S. Cl. 260—29.6 PS** **16 Claims**

Non-alkaline aggregate powder is mixed with an emulsion of an acrylic ester resin to form a resin paste containing a high content of aggregate compared with the resin. The paste is used to impart corrosion resistance to concrete, or for filling joints between tiles or bricks, or to form acid resistant shaped articles.

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3,819,557

## POLYMERIC PIGMENTS AND METHOD FOR PREPARATION THEREOF

**Norman Raymond Loeffler, Freeport, and Hershel Beebe Prindle, Jackson, both of Tex., assignors to The Dow Chemical, Midland, Mich.**

**Filed Sept. 2, 1971, Ser. No. 177,431**

**Int. Cl. C08f** *45/04;* **D21h** *1/28*

**U.S. Cl. 260—29.6 TA** **13 Claims**

Improved polymeric pigments for use in paper coatings are provided by an emulsion polymerization process comprising the steps of (1) emulsion polymerizing at least 50 weight percent of total monomer in absence of emulsifier, (2) adding an emulsifier and (3) continuing emulsion polymerization of the remaining monomer charge.

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3,819,558

## PROCESS FOR PRODUCING CHLORINATED 2,2'-OR 4,4'-BIPYRIDINES

**Sven H. Ruetman, Walnut Creek, Calif., assignor to The Dow Chemical Company, Midland, Mich.**

**Continuation-in-part of Ser. No. 187,533, Oct. 7, 1971, abandoned. This application Apr. 26, 1973, Ser. No. 354,720**

**Int. Cl. C07d** *31/42*

**U.S. Cl. 260—296 D** **4 Claims**

Substituted or unsubstituted 2,2'- or 4,4' bipyridines are ring chlorinated with up to a total of four chlorine atoms by a process wherein a prevaporized mixture of a bipyridine and a reaction medium are contacted with excess chlorine at a temperature of from about 200° to 400°C.

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3,819,559

## ALKYL ACRYLATE-CROTONIC ACID-POLY VINYL LACTAM GRAFT COPOLYMERS

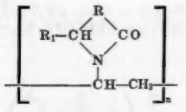
**Eugene S. Barabas, Watchung, N.J., assignor to GAF Corporation, New York, N.Y.**

**Filed Dec. 6, 1972, Ser. No. 312,475**

**Int. Cl. C08f** *33/08*

**U.S. Cl. 260—29.6 WB** **10 Claims**

A graft copolymer of a monomer mixture comprising an acrylic acid ester; and crotonic acid, graft polymerized on a poly (N-vinyl lactam) of the formula



wherein R represents an alkylene bridge group containing from 2 through 4 carbon atoms, $R_1$ represents a member of the group consisting of hydrogen and methyl and n represents the number of the N-vinyl lactam units; stable aqueous emulsions containing same and methods of production.

3,819,560

## VINYL HALIDE POLYMER/EPOXIDE RESIN POWDER COATING COMPOSITIONS

J. Alan Kehr, Saint Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 6, 1972, Ser. No. 215,948
Int. Cl. C08f 45/36
U.S. Cl. 260—31.8 M 8 Claims

The disclosed self-primed vinyl coating compositions are dry powders at room temperature. These powders contain a heat-activatable epoxy adhesive system either absorbed onto the surface of the vinyl powder or otherwise intimately blended therewith. By selecting sufficiently latent co-curatives and catalysts for the adhesive system and blending them with the vinyl, the shelf-life of the composition can be preserved without any loss of the self-priming capability of the composition.

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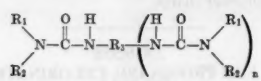
3,819,561

## WETTING AGENTS FOR NON-AQUEOUS DISPERSIONS

Rolf S. Bruenner, Orangevale, Calif., assignor to Aerojet-General Corporation, El Monte, Calif.

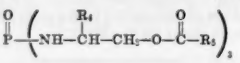
Filed Oct. 23, 1970, Ser. No. 83,473
Int. Cl. C08f 45/44; C08g 51/44
U.S. Cl. 260—326 A 2 Claims

This patent comprises novel non-aqueous dispersions of polar solids in non-polar organic liquids containing a wetting agent which is:



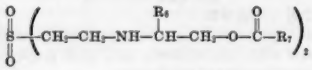
(I)

wherein $R_1$ and $R_2$ are monovalent organic groups such as alkyl or aryl, $R_3$ is an aliphatic or aromatic hydrocarbon structure to which the ureido groups are attached, and $n$ is an integer of from 1 to about 4;



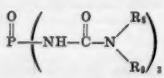
(II)

wherein $R_4$ is hydrogen or monovalent organic, usually lower alkyl, and $R_5$ is monovalent organic such as alkyl or phenyl;



(III)

wherein $R_6$ is hydrogen or lower alkyl and $R_7$ is a monovalent organic group such as alkyl, phenyl or aryl;



(IV)

wherein $R_8$ and $R_9$ are monovalent organic groups such as alkyl or aryl.

3,819,562

## COATING SOLUTIONS OF CITRIC ACID, MALONIC ACID, OR THE ACID ESTER OF CITRIC OF MALONIC ACID AND A SELECTED POLYHYDROXY ALIPHATIC ACID; AND A SELECTED FLUOROOLEFIN COPOLYMER

Paul D. Cargagna, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 4, 1972, Ser. No. 311,978
Int. Cl. C08f 45/34, 3/52
U.S. Cl. 260—33.4 R 12 Claims

Coating solution of certain multicarboxylic acids, e.g., citric acid and certain reactive copolymers, e.g., copolymers containing hydroxyl groups or glycidyl groups, that yields an adherent, transparent, hydrolysis-resistant, abrasion-resistant, thermoformable coating, when cured at moderate temperatures for relatively short times.

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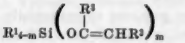
3,819,563

## ROOM TEMPERATURE VULCANIZING ORGANOPOLYSILOXANE COMPOSITIONS

Toshio Takago, Annaka; Tamio Sato, Takasaki, and Hisashi Aoki, Annaka, all of Japan, assignors to Shinetsu Chemical Company, Tokyo, Japan

Filed July 12, 1973, Ser. No. 378,391
Claims priority, application Japan, July 14, 1972, 47-70626
Int. Cl. C08g 51/04, 31/02
U.S. Cl. 260—37 SB 12 Claims

Room temperature vulcanizing organopolysiloxane compositions comprising (1) hydroxyl-endblocked diorganopolysiloxane, (2) alkenyloxysilane, represented by the general formula



where $R^1$ and $R^3$ are the same or different substituted or unsubstituted monovalent hydrocarbon groups, $R^2$ is a hydrogen atom or a substituted or unsubstituted monovalent hydrocarbon group, and m is 3 or 4, and (3) a vulcanizing catalyst. The compositions are stable under substantially moisture-free conditions but become vulcanized upon exposure to air to form solid elastomers. Being free from generation of poisonous or corrosive gases during vulcanization and well adhesive to most substrates, they are suitable for use as sealing, calking, adhesive and coating materials.

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3,819,564

## RAPID CURING POWDERED COATING COMPOSITION

Wayne Gindrup, and Alfred J. Siegmund, Jr., both of Houston, Tex., assignors to Napko Corporation, Houston, Tex.

Filed Nov. 21, 1972, Ser. No. 308,536
Int. Cl. C08g 51/04
U.S. Cl. 260—37 EP 14 Claims

Powdered epoxy coatings capable of rapid cure and flexibility are obtained by adding hydroxy pyridines to epoxy powder coatings hardened with aromatic anhydrides.

Even faster cures can be obtained if the epoxy resin is prebranched with aromatic amines. Better cathodic protection under-cutting resistance is achieved by adding small amounts of 2,3-Epoxy-1-propanol to the prebranched epoxy resin.

3,819,565

## METHOD FOR THE PRODUCTION OF HIGH-STRENGTH CEMENT

**Teturo Yasima; Takao Morisawa, both of Yokkaichi; Eiichi Tazawa, Tokyo, and Yasuhiko Tsuruta, Sagamihara, all of Japan, assignors to Mitsubishi Petrochemical Co., Ltd. and Taiseikensetsu Kabushiki Kaisha, both of Tokyo, Japan**

**Continuation of Ser. No. 130,457, April 1, 1971, abandoned. This application Oct. 24, 1972, Ser. No. 299,847**

**Claims priority, application Japan, Apr. 4, 1970, 45-28376**

**Int. Cl. C04b** *13/30*

**U.S. Cl. 260—42.13** **6 Claims**

Method of the production of high-strength cement which comprises incorporating into normal or high-early-strength cement a macromolecular material formed by copolymerization of at least one monomer which will form homopolymers having a second-order transition point above room temperature, i.e., about 20° C. and at least one monomer which will form homopolymers having a second-order transition point below room temperature, i.e., about 20° C. in the form of a dispersion in water using an emulsifier mainly composed of a nonionic material at a ratio from 3 to 30% by weight of solid content of the macromolecular material based on the cement material and subjecting the mixture to hardening at normal temperature (about 20° C.) for a period from 4 hours to 14 days followed by heat or steam treatment at a temperature from 50° to 150° C. for a period from 10 minutes to 3 days.

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3,819,566

## PREPARATION OF NACREOUS PIGMENTED PLASTIC OBJECTS

**Jules Pinsky, Scarborough; Carl J. Rieger, Yorktown Heights, and Elmer N. Hokanson, Croton, all of N.Y., assignors to The Mearl Corporation, Ossining, N.Y.**

**Filed Dec. 1, 1971, Ser. No. 203,855**

**Int. Cl. C08f** *45/04*; **C08g** *51/04*

**U.S. Cl. 260—42.14** **12 Claims**

The surface stripping of titanium dioxide coated mica platelets in plastic is minimized by the use of a low molecular weight ethylene polymer.

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3,819,567

## SEALER COMPOSITION OF AN ACRYLIC-EPOXY ESTER GRAFT COPOLYMER AND AN EPOXY RESIN

**Ralph G. Swanson, Pinellas Park, Fla., and Aloysius N. Walus, Flint, Mich., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.**

**Continuation-in-part of Ser. No. 204,705, Dec. 3, 1971. This application Dec. 1, 1972, Ser. No. 311,397**

**Int. Cl. C08g** *45/04*

**U.S. Cl. 260—42.28** **10 Claims**

The sealer composition contains a polymeric binder dissolved in an organic solvent in which the polymeric binder comprises the following components:

A. an acrylic-epoxy ester graft copolymer that has a backbone of methyl methacrylate, styrene, ethyl acrylate, acrylonitrile or mixtures thereof, contains 1–7% of methacrylic acid or acrylic acid which has been reacted with an alkylene imine and the polymeric side-chain segments of the graft copolymer are epoxy esters of an epoxy resin and an aliphatic dicarboxylic acid; and

B. an epoxy hydroxy polyether resin;

the novel composition forms a high quality coating and is particularly useful as a sealer composition for automobiles and trucks.

3,819,568

## NON-LEACHABLE U.V. ABSORBER AND DENTAL RESTORATIVE MATERIAL

**Charles W. Taylor, East Oakdale Township, Washington County, and Robert W. H. Chang, Saint Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**Filed Nov. 3, 1969, Ser. No. 873,496**

**Int. Cl. C08f** *45/04*

**U.S. Cl. 260—42.52** **11 Claims**

The adduct of glycidyl methacrylate and phenyl salicylate is found to be a valuable copolymerizable and hence non-leachable stabilizer for acrylate monomers against color change induced by ultra-violet light in dental compositions of inorganic particulate material as filler, N,N-bis(hydroxyalkyl)aromatic amine as potential accelerator and acrylate or methacrylate esters of aromatic or unsaturated lower aliphatic diacid hemiesters or diphenolic ethers with di- or tri-primary diols or triols as vehicles or binders. Polymerization is initiated in these combinations by free-radical generating catalysts.

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3,819,569

## AROMATIC POLYAMIDES STABILIZED WITH NICKELOUS CARBONATE

**Bennett Ray Baird, Camden, S.C., assignor to E. I. du Pont de Nemour and Company, Wilmington, Del.**

**Filed June 28, 1973, Ser. No. 374,570**

**Int. Cl. C08g** *51/56*

**U.S. Cl. 260—45.75 N** **12 Claims**

A composition comprising an aromatic polyamide and nickelous carbonate, which inhibits degradative oxidation of the polyamide. The composition may be shaped, i.e., formed in a fiber, a film, or paper, or the like.

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3,819,570

## PREPARATION AND STABILIZATION OF NITROALKYLPEROXY NITRATES

**Mahmoud S. Kablaoui, Wappingers Falls, and Donald R. Lachowicz, Fishkill, both of N.Y., assignors to Texaco, Inc., New York, N.Y.**

**Continuation of Ser. No. 71,673, Sept. 14, 1970, abandoned. This application Apr. 24, 1972, Ser. No. 247,051**

**Int. Cl. C07c** *77/02*

**U.S. Cl. 260—453 R** **12 Claims**

Vicinal nitroalkylperoxy nitrates are prepared and inhibited from thermally decomposing at temperatures of about 25° to 40° C. by continually contacting the nitrate with dinitrogen tetroxide.

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3,819,571

## POLYMERS STABILIZED WITH TRIMETHYLOL PROPANE PHOSPHITES

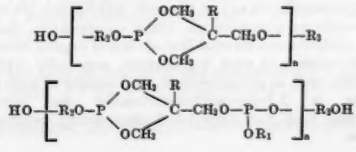
**Alvin Guttag, Bethesda, Md., assignor to Weston Chemical Corporation, New York, N.Y.**

**Continuation-in-part of Ser. No. 758,701, Sept. 10, 1968, abandoned. This application Jan. 16, 1970, Ser. No. 3,501**

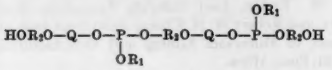
**Int. Cl. C08f** *45/58*

**U.S. Cl. 260—45.8 R** **13 Claims**

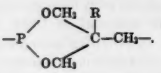
Phosphites, useful for stabilizing polymers, are provided of the formulae



and triads and polymers of triads of the formula



where $n$ is at least 1, R is H or alkyl, $R_1$ is aryl, alkyl, haloaryl, haloalkyl, alkaryl, alkenyl and haloalkenyl, $R_2$ is a hydrogenated dihydric phenol moiety, $R_3$ is H or $R_1$, and Q is



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**3,819,572**

**COMPOSITION OF MATTER STABILIZED WITH 2,4,6-TRIS-(ALKYLTHIOALKYLTHIO)-1,3,5 TRIAZINES**

**Martin Dexter, Briarcliff Manor, and Martin Knell, Ossining, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

**Division of Ser. No. 844,744, July 23, 1969, Pat. No. 3,652,561. This application June 1, 1971, Ser. No. 149,031**

**Int. Cl. C08f** *45/60;* **C08g** *51/60*

**U.S. Cl. 260—45.8 N** **9 Claims**

Organic materials, especially synthetic polymers such as polyolefins, or various lubricating and mineral oils, are stabilized against oxidative and/or thermal degradation by incorporating therein 2,4,6-tris-(alkylthioalkylthio)-1,3,5-triazine compounds.

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**3,819,573**

**POLYMER STABILIZERS PREPARED FROM LACTAMS OR LACTONES AND PHENOLIC COMPOUNDS**

**Jacob Ackermann, Gorla Minore, and Pierino Radici, Turate, both of Italy, assignors to Societa' Italiana Resine S.p.A., Milan, Italy**

**Filed Nov. 9, 1971, Ser. No. 197,156**

**Claims priority, application Italy, Nov. 12, 1970, 31633/70**

**Int. Cl. C08g** *51/54*

**U.S. Cl. 260—45.9 R** **3 Claims**

Stabilisers for polymers derived at least in part from phenolic monomers are made by polymerisation of:

either lactones, lactams, or reactive amine compounds, and optionally dibasic acids also, or their pre-polymerisates, with phenol acids or esters or halides thereof

or alternatively lactones, lactams, or acids or acid halides, and optionally diamines also, or their pre-polymerisates, with phenolic amines.

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**3,819,574**

**DIALKYLPHENOLTHIAZINES AND PHENOLIC ANTIOXIDANTS AS STABILIZING COMPOSITIONS**

**Wade Brown, Yonkers, and Joseph Farber, Yorktown Heights, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

**Continuation-in-part of Ser. No. 28,024, April 13, 1970, abandoned. This application Jan. 20, 1972, Ser. No. 219,506**

**Int. Cl. C08f** *45/58*

**U.S. Cl. 260—45.8 SN** **2 Claims**

Dialkylphenothiazines and phenolic antioxidants are synergistic stabilizing compositions. These compositions stabilize against oxidative and thermal degradation of organic materials normally subject to such degradations, especially synthetic polyolefins such as polypropylene. An example of such compositions is 3,7-di-t-octylphenothiazine and tetrakis-[methylene 3-(3′,5′-di-t-butyl-4′-hydroxyphenyl)propionate] methane.

**3,819,575**

**FLAME RETARDANT COMPOSITIONS**

**Joseph Green, East Brunswick, N.J., assignor to Cities Service Company, New York, N.Y.**

**Filed Apr. 30, 1971, Ser. No. 139,257**

**Int. Cl. C09k** *3/28*

**U.S. Cl. 260—45.75 R** **1 Claim**

Compositions are disclosed which comprise a thermoplastic polyolefin polymer, an organohalide fire retarding agent, and a triazine as a bloom inhibitor. Preferred bloom inhibitors include melamine, melamine resins obtained when formaldehyde is condensed with melamine, melamine pyrophosphate salts, and substitution products of melamine. A metal compound synergist such as antimony oxide is preferably included.

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**3,819,576**

**SALTS OF CYANIMINODITHIOCARBONIC ACID WHICH ARE FUNGICIDAL AGENTS**

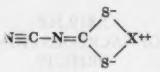
**Raymond Seltzer, New York, N.Y., and William Considine, Pearl, N.Y., assignors to M & T Chemicals, Inc., New York, N.Y.**

**Continuation of Ser. No. 784,878, Dec. 18, 1968, abandoned. This application Jan. 24, 1972, Ser. No. 220,412**

**Int. Cl. C08f** *45/64;* **C08g** *51/64;* **C08h** *17/64*

**U.S. Cl. 260—45.75 K** **2 Claims**

This invention relates to nickel and stannous salts of cyaniminodithio-carbonic acid of the formula



wherein $X^{++}$ is selected from the group consisting of $Ni^{++}$ and $Sn^{++}$; to a method of making said salts, to biological compositions containing said salts as the active agent, and to the use of said salts as biological toxicants.

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**3,819,577**

**FLAME RETARDANT POLYVINYLCHLORIDE COMPOSITIONS**

**Arthur W. McRowe, Akron, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.**

**Filed Oct. 19, 1973, Ser. No. 407,864**

**Int. Cl. C08f** *45/56*

**U.S. Cl. 260—45.75 C** **5 Claims**

Cuprous cyanide and cuprous thiocyanate are effective in reducing flame spread in vinyl chloride polymers and retard smoke formation when vinyl chloride polymers burn.

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**3,819,578**

**PRODUCTION OF MUCONODINITRILE**

**Gerhard J. M. Schmidt, deceased, late of Rehonst, Israel (by Esther Schmidt, legal representative); Joseph Shabtai, Rehovot, and Amiram Hirshfeld, Petah-Tiqua, both of Israel, assignors to Yeda Research and Development Co., Ltd., Rehovot, Israel**

**Filed Sept. 9, 1971, Ser. No. 179,209**

**Claims priority, application Israel, Sept. 17, 1970, 35306**

**Int. Cl. C07c** *121/02*

**U.S. Cl. 260—465.8 R** **8 Claims**

A high yield (92–95 percent) catalytic process for the production of muconodinitrile (1,4-dicyano-1,3-butadiene) by oxidative vapor phase dehydrogenation of 1,4-dicyanobutenes has been developed. The process is applicable to each of the following starting materials: (a) 1,4-dicyano-1-butene, (b) 1,4-dicyano-2-butene, and (c) a mixture of the last two

isomers. The preferred catalysts used are supported bismuth phosphomolybdate or bismuth molybdate systems and the range of operating temperature is between 350–580° C. An important feature of the process is that it involves passing the starting material over the catalyst in admixture with a desorbent, in particular, benzene, which does not participate in the reaction but prevents side reactions of the muconodinitrile formed. The isomeric composition of the muconodinitrile depends on the particular starting material and on the reaction conditions.

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3,819,579

## UNSYMMETRICALLY ALKYL DISUBSTITUTED POLYPHENYLENE ETHERS

**Henricus G. P. Van Der Voort, Amsterdam, Netherlands, assignor to Shell Oil Company, New York, N.Y.**

**Division of Ser. No. 824,292, May 13, 1969, and a continuation-in-part of Ser. No. 680,991, Nov. 6, 1967, abandoned. This application Sept. 29, 1971, Ser. No. 184,953**

**Int. Cl. C08g** *23/18*

**U.S. Cl. 260—47 ET** **5 Claims**

Lubricant compositions containing as an additive a linear alkyl substituted polyphenylene polymer. The phenylene groups may be connected directly together or separated by hydrocarbyl or hetero atoms, e.g., polyphenylene ethers.

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3,819,580

## FLAME-RESISTANT ORGANIC TEXTILES THROUGH TREATMENT WITH HALOGEN CONTAINING SOLUBLE METHYLOL PHOSPHINE ADDUCTS

**Donald J. Daigle, New Orleans; Wilson A. Reeves, and George L. Drake, Jr., both of Metairie, all of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.**

**Division of Ser. No. 141,447, May 7, 1971. This application Dec. 15, 1972, Ser. No. 315,753**

**Int. Cl. C08g** *33/16*

**U.S. Cl. 260—47 P** **2 Claims**

Soluble methylol phosphine adducts which contain halogen atoms attached to aromatic carbon atoms are prepared by reacting tris(hydroxymethyl)phosphine with halogen substituted phenols which contain one or more hydrogens ortho or para to the phenolic hydroxyl group. These adducts are convenient and useful for (a) the preparation of flame-resistant polymers and (b) the preparation of flame- and glow-resistant organic fibrous materials and flame-, glow-, wrinkle-, and shrink-resistant woven and knit textiles wich contain about 25 percent or more cellulosic fibers.

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3,819,581

## EPOXY RESIN COMPOSITIONS CONTAINING AROMATIC DISULFONAMIDE SALTS

**Harry A. Smith, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.**

**Filed Apr. 2, 1973, Ser. No. 347,171**

**Int. Cl. C08g** *30/14*

**U.S. Cl. 260—47 EN** **8 Claims**

Latent curing epoxy resin compositions are described which comprise (1) an epoxy resin such as the diglycidyl ether of bisphenol A, (2) an aromatic disulfonamide such as diphenyl oxide disulfonamide and (3) a salt of an aromatic disulfonamide with substituted tertiary amines or hydrocarbon substituted phosphines wherein components (1), (2) and (3) are present in quantities so as to provide an amine hydrogen equivalent: epoxy equivalent ratio of at least about 0.9:1 and (3) is present in an amount greater than 1.0 weight percent based on the amont of (2).

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3,819,582

## POLYSULPHONES

**Ronald George Feasey, Knebworth, England, assignor to Imperial Chemical Industries Limited, London, England**

**Filed Nov. 29, 1971, Ser. No. 202,986**

**Int. Cl. C08g** *23/20*

**U.S. Cl. 260—63 R** **1 Claim**

A method for the production of aromatic polymers whose molecular chains comprise benzenoid and sulphur atoms in which the alkali metal salt of a thiphenol containing a halogen atom activated by an inert electron-attracting group is polymerised by the displacement of alkali metal halide.

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3,819,583

## METHOD OF PREPARING FERROCENE POLYMERS

**Hiroshi Kato, Takatsuki, Japan, assignor to Dainichi-Nippon Cables, Ltd., Hyogo-ken, Japan**

**Filed Sept. 5, 1972, Ser. No. 286,359**

**Claims priority, application Japan, Sept. 10, 1971, 46-70638; Dec. 22, 1971, 46-104998**

**Int. Cl. C08g** *13/00, 15/00*

**U.S. Cl. 260—63 R** **14 Claims**

The present invention provides a method of preparing ferrocene polymers which comprises reacting ferrocene with aldehydes or ketones in the presence of a Lewis acid catalyst and an aprotic, polar solvent having a dipole moment of at least 0.5 Debye.

The invention has the following advantages in comparison with prior arts; (1) polymer yields are considerably improved. Usually 30 – 60 percent increases are achieved. (2) Quantity of tarry by-products is very small. (3) Most of the ferrocene polymers obtained are tractable. (4) Some of the ferrocene polymers obtained have extremely high electric conductivity.

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3,819,584

## PROCESS FOR PREPARATION OF POLYESTERS

**Takeo Shima; Takayuki Kobayashi; Shoji Kawase, and Shizuka Kurisu, all of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan**

**Filed June 14, 1972, Ser. No. 262,747**

**Int. Cl. C08g** *17/01*

**U.S. Cl. 260—75 M** **6 Claims**

Improved process for producing polyesters which comprises esterifying an aromatic dicarboxylic acid (A) and a bis-$\beta$-hydroxyethyl ester (B) of said acid (A), and then heating the esterified product at reduced pressure in the presence of a polycondensation catalyst, wherein

1. said acid (A) is reacted in an amount in excess of one-half mol and not larger than 6/5 mols per mol of said ester (B), and
2. at a time after the esterification reaction conversion has reached 70%, the ester (B) is additionally supplied in an amount of $x$ mol per mol of the total amount of said acid (A), $x$ being defined by the following equations:

a. where the mol ($y$) of said acid (A) is $1/2<y<8/9$,

$$0.03\ y - 0.015 < x < (2y-1)/(y+1) \quad (1)$$

b. where the mol ($y$) of said acid (A) is $8/9 < y < 6/5$,

$$0.476\ y - 0.411 < x < (2y-1)/(y1) \quad (2)$$

and thereafter, said polycondensation reaction is preformed.

3,819,585

## POLYESTER ESTERIFICATION UNDER TWO DIFFERENT PRESSURES

**Paul M. Funk, Decatur; Billy J. Legg, and Richard W. Baldwin, both of Athens, all of Ala., assignors to Monsanto Company, St. Louis, Mo.**

**Continuation-in-part of Ser. No. 185,010, Sept. 30, 1971, abandoned. This application Jan. 26, 1973, Ser. No. 326,935**

**Int. Cl. C08g** *17/01*

**U.S. Cl. 260—75 M** **10 Claims**

In the process for continuous production of highly polymeric synthetic linear polyester polymers, where ethylene glycol and terephthalic acid are reacted to form bis(beta hydroxy) ethyl terephthalate and low molecular weight polymer and thereafter subjected to polycondensation — the improvement is provided wherein a first phase of esterification is conducted at about 0–5 psig (0–0.35 kg/cm² gauge) pressure through about 75–95% of esterification; during which water is easily removed, as is a substantial amount of ethylene glycol; and a second phase conducted at a pressure substantially higher than the first phase during which percent of esterification is increased to about 95–99%.

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3,819,586

## COATING MATERIAL BASED ON BLOCKED POLYURETHANES

**Hans Rudolph; Rolf Dhein, both of Krefeld-Bockum; Eckhard De Cleur, Duisburg, and Hans-Joachim Kreuder, Krefeld-Bockum, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany**

**Continuation-in-part of Ser. No. 184,256, Sept. 27, 1971, abandoned. This application June 2, 1972, Ser. No. 259,144**

**Claims priority, application Germany, Sept. 29, 1970, 2047718**

**Int. Cl. C08g** *22/32;* **B05b** *5/00*

**U.S. Cl. 260—77.5 TB** **3 Claims**

The invention relates to new varnish binders for coating materials and to a process of forming a continuous coating on an article by spraying a pulverulent coating material preferably having a softening point of 40°C, comprising those varnish binders of the present invention being pulverulent and having a softening point of at least 40°C, optionally in mixtures with additives, through an electric field on an article to adhere the said pulverulent coating material to said article and baking said coating material to fuse it into a continuous coating.

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3,819,587

## WHOLLY AROMATIC CARBOCYCLIC POLYCARBONAMIDE FIBER HAVING ORIENTATION ANGLE OF LESS THAN ABOUT 45°

**Stephanie Louise Kwolek, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.**

**Continuation-in-part of Ser. No. 827,345, May 23, 1969, Pat. No. 3,671,542, which is a continuation-in-part of Ser. No. 736,410, June 12, 1968, abandoned, which is a continuation-in-part of Ser. No. 644,851, June 9, 1967, abandoned, which is a continuation-in-part of Ser. No. 556,934, June 13, 1966, abandoned. This application Sept. 7, 1971, Ser. No. 178,184**

**Int. Cl. C08g** *20/20, 20/38*

**U.S. Cl. 260—78 R** **16 Claims**

Fibers of unique internal structure (evidenced by low orientation angle and/or high sonic velocity) and exceptionally high tensile properties (e.g., initial modulus) are prepared from spinning dopes of selected carbocyclic aromatic polyamides in suitable liquid media.

3,819,588

## PROCESS FOR SAPONIFYING POLYPEPTIDES CONTAINING A UNIT OF GLUTAMIC ACID-GAMMA-ESTER USING A MIXTURE OF ALCOHOLS IN THE PRESENCE OF AN ALKALINE METAL HYDROXIDE

**Yasuo Fujimoto, 1177-4 Ichigacho, Midori-Ku, Tokyohama, and Yoichi Koiwa, 5-16-14, Hatanodai, Tokyo, both of Japan**

**Filed Aug. 28, 1972, Ser. No. 284,134**

**Claims priority, application Japan, Sept. 6, 1971, 46-68110**

**Int. Cl. C08g** *20/06*

**U.S. Cl. 260—78 A** **10 Claims**

A process for preparing a polypeptide or copolypeptide having a high molecular weight and a narrow molecular weight distribution and containing a unit of an alkali metal salt of glutamic acid is provided. The polypeptide or copolypeptide is prepared by saponifying a polypeptide or copolypeptide having a unit of a γ-ester of glutamic acid within the molecule with an alkali metal hydroxide.

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3,819,589

## POLYMERIC QUATERNARY AMMONIUM BETAINES

**Allen R. Fauke, and Rudolf S. Buriks, both of Saint Louis, Mo., assignors to Petrolite Corporation, Wilmington, Del.**

**Filed Feb. 17, 1972, Ser. No. 227,261**

**Int. Cl. C08f** *27/08*

**U.S. Cl. 260—78.5 T** **9 Claims**

Polymeric quaternary ammonium betaines; the preparation thereof; and uses therefor. These are illustrated by polymers and copolymers of dicarboxylic anhydrides such as maleic anhydride and copolymers thereof derived from copolymerizable compounds such as olefins, vinyl compounds, etc; a carboxylic acid group of the anhydride polymeric unit being esterified with a quaternary alkanolamine. The polymers are prepared by reacting the anhydride-containing polymer with an alkylene oxide and a tertiary amine to form quaternary alkanolamine esters.

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3,819,590

## METHOD OF PRODUCING ALTERNATING COPOLYMERS OF CONJUGATED DIENES AND CONJUGATED POLAR ETHYLENICALLY UNSATURATED MONOMERS

**Akira Onishi and Koichi Irako, Tokyo, Yutaka Iseda, Uji, Yoshihiro Hayakawa, Tokyo, Takahiro Kawagoe, Tokorozawa, and Shoji Miyamoto, Tokyo, Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan**

**Filed July 28, 1969, Ser. No. 845,338**

**Claims priority, application Japan, Aug. 2, 1968, 43/54,302; Aug. 8, 1968, 43/55,809; Oct. 18, 1968, 43/75,550**

**Int. Cl. C08f**

**Int. Cl. 260—80.7** **21 Claims**

Alternating copolymers of a conjugated diene with a conjugated polar ethylenically unsaturated monomer, wherein the conjugated diene unit and the conjugated polar ethylenically unsaturated monomer unit are bonded substantially alternately, are produced by copolymerizing said conjugated diene with said conjugated polar ethylenically unsaturated monomer by means of a catalyst prepared from a component (A) of a compound of a transition metal of the Group IV or V in the Periodic Table, provided that the chelate compounds are excepted, and a component (B) of a zinc halide or an aluminum compound containing halogen. This copolymerization activity can be improved by adding a component (C )of a radical initiator selected from the group consisting of organic peroxides, azonitrile compounds and trialkylboron-oxygen system to the above described components (A) and (B). Furthermore, the molecular weight of the alternating co polymer can be adjusted by adding a molecular weight

regulator selected from the group consisting of mercaptans and carbon polyhalides containing bromine or iodine as an essential component to the polymerization reaction system.

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3,819,591
**BRANCHED-CHAIN HYDROCARBON ELASTOMERS**

**John B. Campbell, R.D. Mill Creek Road, Hockessin, Del. 19707, and Robert Dean Thurn, 4310 Miller Road, Wilmington, Del. 19803**

**No Drawing. Continuation of application Ser. No. 38,862, May 19, 1970, which is a continuation-in-part of application Ser. No. 625,598, Mar. 24, 1967, both now abandoned. This application Apr. 13, 1972, Ser. No. 247,879**

**Int. Cl. C08d** *3/02, 3/04, 9/02*

**U.S. Cl. 260—80.78** **38 Claims**

The incorporation of a $C_5$ to $C_{110}$ polyolefin having two polymerizable double bonds added in amounts of from 0.01 to 0.5 gram-moles/kg. in EPDM elastomer produces chain branching, with a consequent improvement in properties such as cold-flow of the uncured stock, and improved ozone resistance of natural rubber blends.

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3,819,592
**MOLECULAR WEIGHT REGULATION OF ETHYLENE-ALPHA-OLEFIN COPOLYMERS**

**Harry Dale Visser, Cheshire, and Walter Nudenberg, Newtown, Conn., assignors to Uniroyal, Inc., New York, N.Y.**

**No Drawing. Filed Aug. 27, 1973, Ser. No. 391,902**

**Int. Cl. C08f** *1/56, 1/34, 1/80*

**U.S. Cl. 260—80.78** **42 Claims**

In the copolymerization of alpha-olefins, especially the copolymerization of ethylene and propylene (with a diene if desired), using a coordination type catalyst based on a vanadium salt and an alkylaluminum halide, the molecular weight of the polymer can be regulated, and, in some cases, the activity of the catalyst can be enhanced, by adding certain dithiocarbamates, phosphorodithioates or dithiocarbonates. Elastomers having improved processability can be made in this way, as well as elastomers which are liquids at ambient temperatures and which are useful as adhesives, sealants, etc.

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3,819,593
**HYDROXYETHYLMETHYLCELLULOSE AS A PROTECTIVE COLLOID IN VINYLACETATE EMULSION POLYMERIZATION**

**Ronald L. Glomski, Midland, Mich., and Allen H. Jones, Jr., Richardson, Tex., assignors to The Dow Chemical Company, Midland, Mich.**

**No Drawing. Filed May 11, 1973, Ser. No. 359,180**

**Int. Cl. C08f** *3/56, 15/20*

**U.S. Cl. 260—86.1 E** **5 Claims**

An improvement in the process for preparing vinyl acetate polymers in aqueous emulsion comprising the use of hydroxyethylmethylcellulose having a thermal gel point greater than 100° C., a hydroxyethyl MS of from about 0.85–3.5, a methoxyl DS of from about 0.4–1.6 and a viscosity at 20° C. of from about 2 to 200 cps., as a protective colloid in the emulsion polymerization reaction.

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3,819,594
**TETRAFLUOROETHYLENE FINE POWDER RESIN OF A COPOLYMER OF TETRAFLUOROETHYLENE AND PERFLUORO (ALKYL VINYL ETHER)**

**David Alan Holmes, Vienna, W. Va., and Edgar William Fasig, Jr., Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.**

**No Drawing. Filed May 17, 1972, Ser. No. 254,014**

**Int. Cl. C08f** *15/02*

**U.S. Cl. 260—87.5 A** **9 Claims**

Tetrafluoroethylene fine powder resin of a copolymer of tetrafluoroethylene with perfluoro (alkyl vinyl ether) is provided having improved flex life resulting from having a specific melt viscosity of from $1\times10^9$ to $4.0\times10^{10}$ poises at 380° C. and a standard specific gravity of from 2.135 to 2.175. The resin is made by the aqueous dispersion polymerization process; a persulfate initiator is used.

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3,819,595
**NUCLEATION OF NORMALLY CRYSTALLINE VINYLIDENE CHLORIDE POLYMERS**

**Henry N. Beck, Walnut Creek, Calif., and Harvey D. Ledbetter and John A. Schmitt, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.**

**No Drawing. Original application Sept. 5, 1972, Ser. No. 286,172, now Patent No. 3,769,269. Divided and this application Apr. 20, 1973, Ser. No. 353,022**

**Int. Cl. C08f** *3/28, 15/08*

**U.S. Cl. 260—87.7** **1 Claim**

Normally crystalline vinylidene chloride polymers containing at least about 70 percent by weight of vinylidene chloride with any remainder being vinyl chloride are admixed with minor amounts of a compound selected from the group consisting of melamine, trichloromelamine, 5,6 - dichlorobenzimidazole, 2 - phenylbenzimidazole, 6-nitrobenzimidazole, 6-nitrobenzimidazole sodium salt indazole, 4-nitrindazole, 5-nitroindazole, 6-nitroindazole and 7-nitroindazole, among other compounds, to provide improved crystalline rates.

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3,819,596
**HOMOPOLYMERS OF ISOPROPENYL ALKYL ETHERS**

**James R. Gross, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.**

**No Drawing. Filed Feb. 23, 1973, Ser. No. 335,378**

**Int. Cl. C08f** *3/38*

**U.S. Cl. 260—91.1 M** **6 Claims**

Homopolymers of isopropenyl alkyl ethers having two terminal double bonds and a broad molecular weight distribution are prepared by contacting the monomer with an alkaline earth substituted sodium alumino-silicate at a temperature below 0° C.

The homopolymers are useful as hot melt adhesives for porous and non-porous substrates as well as intermediates and as internal plasticizers for vinyl polymers.

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3,819,597
**POLYMERIZATION OF VINYL AROMATIC MONOMERS IN AQUEOUS SUSPENSION**

**Colin Temple Richards, Old Windsor, England, assignor to BP Chemicals Limited, London, England**

**No Drawing. Filed Nov. 30, 1971, Ser. No. 203,438**

**Claims priority, application Great Britain, Dec. 3, 1970, 57,466/70**

**Int. Cl. C08f** *1/11, 7/04*

**U.S. Cl. 260—93.5 W** **11 Claims**

Large polyvinyl aromatic beads are produced by polymerising in slush until a proportion of the monomer is polymerised, then dispersing the organic phase in water by adding a surfactant and an alkali metal orthophosphate and precipitating an inorganic phosphate suspending agent. The polymerisation is continued in suspension.

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3,819,598
**CATALYST COMPOSITION FOR THE POLYMERIZATION OF OLEFINS**

**Francis R. Galiano, Overland Park, and Gene E. Kellum, Shawnee, Kans., Terry R. King, Orange, Tex., and David Rankin, Kansas City, Kans., assignors to Gulf Research & Development Company, Pittsburgh, Pa.**

**No Drawing. Filed Dec. 6, 1971, Ser. No. 205,371**

**Int. Cl. C08f** *1/66, 3/06*

**U.S. Cl. 260—94.9 D** **4 Claims**

An improved catalyst composition for the polymerization of mono 1-olefins comprising chromium oxide supported on a precipitated, porous silica having a surface

area of not less than 150 square meters per gram and wherein the average diameter of the silica particles is less than 0.0005 millimeter.

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**3,819,599**

## CATALYST AND PROCESS FOR THE POLYMERIZATION OF ETHYLENE AND TERMINAL OLEFINS

**Peter Fotis, Highland, Ind., and David E. Boone, Downers Grove, Ill., assignors to Standard Oil Company, Chicago, Ill.**

**No Drawing. Filed May 31, 1972, Ser. No. 258,319**
**Int. Cl. C08f** *1/56, 3/06*
**U.S. Cl. 260—94.9 DA** **15 Claims**

An improved method of preparing a supported catalyst and process for the use thereof for polymerization of ethylene, terminal olefins or a mixture thereof that gives high polymer yields and improved molecular weight control when used in conjunction with chain terminating agents which comprises contacting said olefin or said mixture with (a) a Group IV–B or Group V–B transition metal compound in combination with a support material which is the reaction product of an aluminum halide and a Group II–A, II–B or VII–B hydroxyhalide, alkoxide, hydroxide-alkoxide, hydrous oxide, hydrated oxide or hydroxide and (b) an organoaluminum compound.

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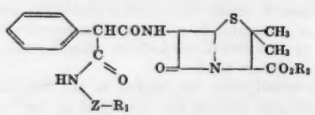
**3,819,600**

## α-CARBOXAMIDO ACYL DERIVATIVES OF PENICILLIN

**Ernest S. Hamanaka, Groton, Conn., assignor to Pfizer Inc., New York, N.Y.**

**No Drawing. Filed Jan. 28, 1972, Ser. No. 221,814**
**Int. Cl. C07d** *99/16*
**U.S. Cl. 260—239.1** **12 Claims**

Penicillins of the formula



wherein $R_1$ is alkyl or substiuted alkyl wherein said alkyl contains from 1 to 4 carbonatoms and said substituent is carboxy, carbamyl, cyano, chloro, bromo or alkoxy or alkylthio containing 1 to 3 carbon atoms; Z is —O—,

or $SO_2$; $R_2$ is hydrogen or 1-alkanoyloxyalkyl wherein said alkanoyl contains 2 to 5 carbonatoms and said alkyl contains from 1 to 4 carbon atoms; and the pharmaceutically acceptable salts thereof, wherein said pencillin is an acid as broad spectrum antibiotics.

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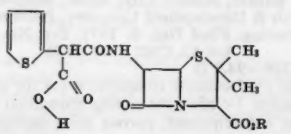
**3,819,601**

## α-CARBOXY - 2 - THIENYLMETHYLPENICILLIN AND CEPHALOSPORIN AND ESTERS AND SALTS THEREOF

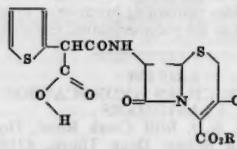
**Robert L. Rosati, New London, Conn., assignor to Pfizer Inc., New York, N.Y.**

**No Drawing. Filed Feb. 24, 1972, Ser. No. 229,175**
**Int. Cl. C07d** *99/16, 99/24*
**U.S. Cl. 260—239.1** **2 Claims**

Compounds of the formulae



and



wherein R is hydrogen or 1-alkanoyloxyalkyl wherein said alaknoyl contains from 2 to 5 carbon atoms and said alkyl contains from 1 to 4 carbon atoms and the pharmaceutically acceptable base salts thereof as broad spectrum antibiotics.

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**3,819,602**

## 7-CHLORO - 5 - (2-FLUOROPHENYL)-1-(2-HYDROXYETHYL) - 1,3 - DIHYDRO - 2H-1,4-BENZODIAZEPIN - 2 - ONE AND ESTERS THEREOF

**Rodney Ian Fryer, North Caldwell, and Leo Henryk Sternbach, Upper Montclair, N.J., assignors to Hoffmann-La Roche, Inc., Nutley, N.J.**

**No Drawing. Continuation-in-part of application Ser. No. 806,702, Mar. 12, 1969, which is a continuation-in-part of application Ser. No. 727,356, May 7, 1968, now abandoned. This application Oct. 4, 1971, Ser. No. 186,399**
**Int. Cl. C07d** *53/06*
**U.S. Cl. 260—239.3 D** **17 Claims**

7-chloro-5-(2-fluorophenyl) - 1 - (2- hydroxyethyl)-1,3-dihydro-2H-1,4-benzodiazepin-2-one, esters and other derivatives thereof. In a broader aspect, the invention relates to certain derivatives of hydroxy-lower alkyl benzodiazepines. The compounds of the present invention induce sleep and hence, are useful as sedative agents.

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**3,819,603**

## SULFAGUANIDINES

**Tsung-Ying Shen, Westfield, Michael W. Fordice, Cranford, William V. Ruyle, Scotch Plains, and Norman P. Jensen, Watchung, N.J., assignors to Merck & Co., Inc., Rahway, N.J.**

**No Drawing. Continuation-in-part of abandoned application Ser. No. 51,341, June 30, 1970. This application Feb. 16, 1971, Ser. No. 115,731**
**Int. Cl. C07d** *31/48, 91/36, 63/12*
**U.S. Cl. 260—239.6** **7 Claims**

Novel sulfaguanidines are useful in reducing mortality and decreasing lesion incidence of poultry exposed to Marek's disease.

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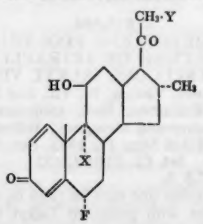
**3,819,604**

## 6,9,21-TRIHALOGENOSTEROIDS

**Ulrich Kerb, Karl Heinz Kolb, and Gunter Klink, Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Germany**

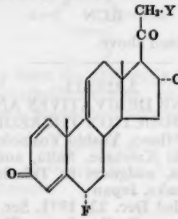
**No Drawing. Continuation of application Ser. No. 9,246, Sept. 30, 1969. This application June 5, 1972, Ser. No. 259,819**
**Claims priority, application Germany, Oct. 2, 1968, P 18 01 390.6**
**Int. Cl. C07c** *173/00*
**U.S. Cl. 260—239.55 R** **10 Claims**

6,9,21-trihalogenosteriods of the formula



(I)

wherein X is fluorine, chlorine or bromine and Y is chlorine or fluorine. The compounds are made by subjecting a steroid of the general formula



(II)

wherein Y has the same meaning as above to reaction with a hypohalogenous acid of the type HOX' wherein X' is chlorine or bromine and if it is desired that X be fluorine then converting the 9α-chlorine or -bromine-11β-hydroxy compound to the 9,11-epoxide followed by opening of the epoxide ring with hydrogen fluoride.

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**3,819,605**

## ANTICOAGULANT ISOLATION FROM PIT VIPER USING A MODIFIED AGAROSE BED AND ELUTING WITH A BENZAMIDINE SOLUTION

**William Homer Holleman, Libertyville, and Larry James Weiss, North Chicago, Ill., assignors to Abbott Laboratories, North Chicago, Ill.**

**No Drawing. Filed Aug. 17, 1973, Ser. No. 389,278**
**Int. Cl. A61k *17/00***
**U.S. Cl. 260—112 R** **7 Claims**

A process for the isolation of the thrombin-like fraction of the venom of the pit viper *Bothrops atrox* (fer-de-lance) is described. The simple process basically consists of placing the clear venom solution on a column containing a specifically modified agarose bed, washing said column, eluting the thrombin-like acting component from said column with an aqueous benzamidine solution and isolating said fraction from said benzamidine solution.

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**3,819,606**

## PROCESS FOR THE MANUFACTURE OF POLYPEPTIDES

**Christopher Frederick Hayward and Michael James Smithers, Macclesfield, England, assignors to Imperial Chemical Industries, Limited, London, England**

**No Drawing. Filed May 10, 1971, Ser. No. 142,073**
**Claims priority, application Great Britain, May 13, 1970, 23,219/70**
**Int. Cl. C07c *103/52***
**U.S. Cl. 260—112.5** **7 Claims**

An improved process for the manufacture of α-aspartyl-phenylalanine esters and α-aspartyl-(β-cyclohexyl)alanine esters by reacting aspartic acid or a protected derivative with an N-carbonyl derivative of a phenylalanine ester or a (β-cyclohexyl)alanine ester. The products are sweetening agents.

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**3,819,607**

## METHOD FOR PRODUCING PEPTIDES BY REACTION OF AMINO ACID N-CARBOXYANHYDRIDES WITH SCHIFF'S BASES

**Leon John Heuser, Robbinsville, and Carl Francis Anderson, Milltown, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.**

**No Drawing. Continuation-in-part of abandoned application Ser. No. 31,755, Apr. 24, 1970. This application July 31, 1972, Ser. No. 276,505**
**Int. Cl. C07c *103/52*; C07g *7/00***
**U.S. Cl. 260—112.5** **5 Claims**

Peptides are produced by an improved method which minimizes side reactions and facilitates the separation of the product in high yield. This method comprises reacting the imine reaction product of one amino acid and an aromatic aldehyde with about an equimolar proportion of the N-carboxy anhydride of a second amino acid at a temperature within the range of about 0° to 60° C. in an organic solvent within which both reactants are soluble and hydrolyzing the reaction product with aqueous acid.

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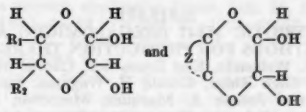
**3,819,608**

## PROCESS FOR HARDENING GELATIN USING PARTICULAR DIHYDROXY DIOXANES

**Nobuo Yamamoto, Kameji Nagao, and Ikutaro Horie, Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan**

**No Drawing. Continuation of abandoned application Ser. No. 850,673, Aug. 15, 1969. This application Nov. 24, 1971, Ser. No. 201,999**
**Claims priority, application Japan, Aug. 17, 1968, 43/58,799**
**Int. Cl. C09h *7/00***
**U.S. Cl. 260—117** **15 Claims**

A process for hardening gelatin which comprises reacting the gelatin with at least one compound represented by the formulae:



wherein $R_1$ represents a member selected from the group consisting of a hydrogen atom, an alkyl group, a halogen-substituted alkyl group, an alkoxyalkyl group, an aryl group and an aryloxyalkyl group; $R_2$ represents a member selected from the group consisting of an alkyl group, a halogen-substituted alkyl group, an alkoxyalkyl group, an aryl group and an aryloxyalkyl group; and Z represents non-metallic atoms requisite for forming a carbon ring selected from the group consisting of a saturated ring and an unsaturated ring, wherein said ring may be substituted.

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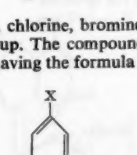
**3,819,609**

## FUNGICIDAL-2-ALKOXY-5-HALOGENO-BENZENE DIAZONIUM CYANIDES

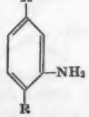
**Maria Puklics, Lajos Guczoghy, Gyorgy Matolcsy, and Janos Bodnar, Budapest, Hungary, assignors to Chinoin Gyogyszer-és Vegyeszeti Termekek Gyora Rt., Budapest, Hungary**

**No Drawing. Filed July 7, 1971, Ser. No. 160,524**
**Claims priority, application Hungary, July 10, 1970, CI–1,011**
**Int. Cl. A01n *17/08*; C07c *113/04***
**U.S. Cl. 260—141** **1 Claim**

A fungicidal compound of the formula



where X is fluorine, chlorine, bromine or iodine and R is a $C_1$–$C_7$ alkoxy group. The compound is made by diazotizing a compound having the formula



to produce a diazonium salt which is reacted, preferably without isolation, with an alkali metal cyanide.

3,819,610
**PROCESS FOR PREPARING POLYCELLULAR PROTEIN PRODUCTS**
Cavit Akin, Oakbrook, Ill., assignor to Standard Oil Company, Chicago, Ill.
No Drawing. Filed Oct. 29, 1970, Ser. No. 85,268
Int. Cl. D01f 9/04
U.S. Cl. 264—202 5 Claims

Protein-containing single cell micro-organism are chemically prepared into a product, having sufficient intercellular bonds formed between individual cells to render the product non-dispersible in water, by a process in which certain functional groups in the individual cell walls, such as hydroxide groups, amine groups, and —S—S— groups, are first chemically activated and then induced to form intercellular bonds with the cells walls of adjacent cells. The protein product prepared by the process is suitable for use as an additive to or substitute for natural foods. The protein products prepared by the process are also suitable, for example, in the preparation of biodegradable containers, packing materials, and utensils.

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3,819,611
**ANTIBIOTIC W847 (MEGALOMICIN) AND METHODS FOR PRODUCTION THEREOF**
Marvin J. Weinstein, East Brunswick, George M. Luedemann, Glen Ridge, Gerald H. Wagman, East Brunswick, and Joseph A. Marquez, Montclair, N.J., assignors to Schering Corporation, Bloomfield, N.J.
No Drawing. Application Sept. 4, 1969, Ser. No. 855,424, now Patent No. 3,632,750, which is a continuation-in-part of application Ser. No. 707,100, Feb. 21, 1968, which in turn is a continuation-in-part of application Ser. No. 641,522, May 26, 1967, both now abandoned. Divided and this application June 25, 1971, Ser. No. 157,030
Int. Cl. C07c 129/18
U.S. Cl. 260—210 AB 20 Claims

A new antibiotic complex identified as Antibiotic W847 Complex, (or Antibiotic W847 or *megalomicin*), composed of at least four major antibiotic components is produced by the cultivation under submerged aerobic conditions of *Micromonospora megalomicea*, a hitherto undescribed species of the genus *Micromonospora* of the order Actinomycetales. The indivdual components are isolated by solvent extraction and chromatography and are characterized by their respective chemical and biologoical properties.

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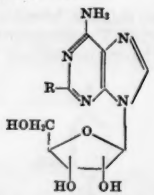
3,819,612
**2-SUBSTITUTED ADENOSINE DERIVATIVES AND THE PRODUCTION THEREOF**
Kin-ichi Imai, Toyonaka, and Mikio Honjo, Takatsuki, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan
No Drawing. Filed Sept. 23, 1971, Ser. No. 183,270
Claims priority, application Japan, Sept. 25, 1970, 45/84,369
Int. Cl. C07d 51/54
U.S. Cl. 260—211.5 R 7 Claims

Novel 2-substituted adenosine derivatives having a prolonged coronary dilatory and hypotensive action are provided represented by the formula



wherein R is an alkyl group of 2 to 4 carbon atoms or phenyl group having no substituent or having, at least one nitro, halogen, alkyl or alkoxy substituent. A process for the preparation of these compounds is also provided involving reacting 5-amino-1-(β-D-ribofuranosyl)-4-imidazolecarbonitrile with a nitrile compound of the formula

RCN

wherein R is as defined above.

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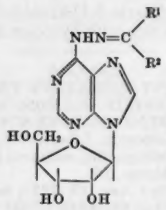
3,819,613
**ADENOSINE DERIVATIVES AND THE PRODUCTION THEREOF**
Ryuji Marumoto, Minoo, Yoshio Yoshioka, Higashiyodogawa, Katsuyoshi Kawazoe, Suita, and Mikio Honjo, Takatsuki, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan
No Drawing. Filed Dec. 22, 1971, Ser. No. 211,107
Claims priority, application Japan, Dec. 28, 1970, 46/124,064
Int. Cl. C07d 51/54
U.S. Cl. 260—211.5 R 11 Claims

Compounds of the formula



are disclosed wherein $R^1$ is hydrogen or lower alkyl and $R^2$ is a hydrocarbon residue or a heterocyclic, each of which may be optionally substituted, or $R^1$ and $R^2$ taken together with the adjoining carbon atom constitute indanidene or N-methylbenzothiazolidene. These compounds are useful as hypotensive agents.

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3,819,614
**7,12 DI(LOWER)ALKYL-HOMOBENZMORPHANS**
Stephen I. Sallay, Fort Wayne, Ind., assignor to American Home Products Corporation, New York, N.Y.
No Drawing. Filed Oct. 22, 1970, Ser. No. 83,150
Int. Cl. C07d 41/08
U.S. Cl. 260—239 BB 3 Claims

Novel 7,12 - di(lower)alkyl-homobenzmorphans have been prepared which are pharmacologically active as control nervous system depressants.

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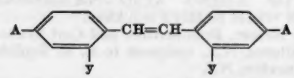
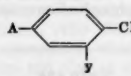
3,819,615
**PROCESS FOR THE MANUFACTURE OF STILBENE COMPOUNDS**
Adolf Emil Siegrist, Basel, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland
No Drawing. Filed Nov. 6, 1972, Ser. No. 304,289
Claims priority, application Switzerland, Nov. 22, 1971, 16,948/71
Int. Cl. C07d 55/02
U.S. Cl. 260—240 C 13 Claims

The present invention provides a process for the manufacture of stilbene compounds of the formula



wherein A stands for a benzo [b]furan-2-yl, naphtho-[1,2-b]furan-2-yl, naphtho[2,1-b]furan-2-yl, benzo [b] thiophen-2-yl, naphtho[2,1-b]thiophen - 2-yl, benzoxazol-2-yl, naphthoxazol-2-yl, benzotriazol-2-yl, naphtho[1,2-d] triazol-2-yl, benzo[1,2-d:3,4-d']bis-triazol - 2-yl or phenethinyl radical, which itself can again be substituted by chlorine or alkyl, cyclohexyl phenyl-(1-4C)-alkyl, phenyl, methylenedioxy, phenoxy or alkoxy groups or which can contain a 6-membered carbocylic ring which is fused

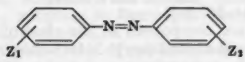
to it and wherein *y* stands for a hydrogen atom, chlorine or the N,N-dimethylcarbamyl radical, characterised in that a compound of the formula



wherein A and y have the previously indicated meaning is oxidised in dimethylformamide, whilst excluding air, in the presence of a potassium compound of the formula

$$KOC_{(x-1)}H_{(2x-1)}$$

wherein *x* denotes an integer from 1 to 6, with an azobenzene of the formula



wherein $Z_1$ and $Z_2$ stand for hydrogen or chlorine; the present invention further provides new stilbene derivatives which can be manufactured according to this process and which can be used as optical brighteners.

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**3,819,616**

**IMINES, THEIR PREPARATION AND THEIR PHARMACEUTICAL USE**

**Florin Seng, Cologne-Buchheim, Kurt Ley, Odenthal-Globusch, and Karl Georg Metzger, Wuppertal-Elberfeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany**

**No Drawing. Filed Mar. 31, 1971, Ser. No. 130,007**
**Claims priority, application Germany, Apr. 2, 1970, P 20 15 676.7**
**Int. Cl. C07d** *51/78*
**U.S. Cl. 260—240 G** **15 Claims**

Imines of 2-formylquinoxaline-3-carboxylic acid-1,4-dioxides and their salts are obtained through treatment of the lactone or a salt of 2-dihydroxymethylquinoxaline-N,N-dioxide-3-carboxylic acid with a reactant bearing a free primary amino group. The resultant compounds and their non-toxic salts are antibacterial agents and can be incorporated in pharmaceutical compositions and feedstuffs for this use. A typical embodiment is 2-(carbomethoxyhydrazonomethyl)-quinoxaline-3-carboxylic acid-1,4-dioxide.

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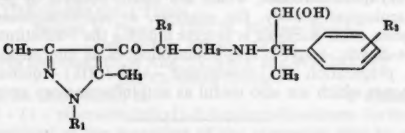
**3,819,617**

**PYRAZOLYL-PHENYLALKYLAMINO-KETONES**

**Walter von Bebenburg, Frankfurt, and Klaus Posselt, Bergen-Enkheim, Germany, assignors to Deutsche Gold- und Silber-Scheideansalt vormals Roessler, Frankfurt, Germany**

**No Drawing. Filed Oct. 18, 1971, Ser. No. 190,377**
**Claims priority, application Austria, July 8, 1971, A 5,967/71**
**Int. Cl. C07d** *49/18*
**U.S. Cl. 260—240 K** **11 Claims**

Compounds are prepared having the formula



wherein $R_1$ is benzyl, benzyl with 1 to 2 halogen atoms attached thereto, benzyl with 1 or 2 lower alkyl groups, alkenyl or alkinyl with 2 to 6 carbon atoms, phenyl substituted alkenyl or alkinyl with up to 6 carbon atoms in the alkenyl or alkinyl group or when $R_3$ is alkyl, methyl, $R_2$ is hydrogen, methyl or ethyl, and $R_3$ is hydrogen, halogen lower alkyl or lower alkoxy and their salts. They have antiphlogistic activity and also are useful in heart circulatory illnesses.

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**3,819,618**

**THIAZOLO[3,4-a]BENZIMIDAZOLES**

**Rudiger Dieter Haugwitz, Titusville, and Venkatachala Lakshmi Narayanan, Hightstown, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.**

**No Drawing. Filed Oct. 2, 1972, Ser. No. 294,125**
**Int. Cl. A61k** *27/00;* **C07d** *91/24*
**U.S. Cl. 260—240 F** **7 Claims**

Disclosed are 3 - substituted - 1-imino-1H,3H-thiazolo-[3,4-a]benzimidazoles, 3 - substituted-1H,3H - thiazolo-[3,4-a]-benzimidazole-1-ones and derivatives thereof. In addition, methods for preparing said compounds, compositions containing said compounds and methods for the use of said compositions as anthelmintics are taught.

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**3,819,619**

**N-ISOBORNYLOXYCARBONYLCEPHALOSPORIN C**

**Satoshi Horii, Takatsuki, Nariakira Mizokami, Suita, Masahiko Fujino, Takarazuka, and Susumu Shinagawa, Michihiko Ochiai, and Tetsuya Okutani, Suita, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan**

**No Drawing. Filed Feb. 24, 1972, Ser. No. 229,169**
**Claims priority, application Japan, Feb. 26, 1971, 46/10,063, 46/10,137; Aug. 17, 1971, 46/62,417**
**Int. Cl. C07d** *99/24*
**U.S. Cl. 260—243 C** **1 Claim**

This invention relates to N-isobornyloxycarbonylcephalosporin C which is useful as an intermediate for the production of cephalosporin C and other cephalosporanic acid derivatives and is also useful as an antimicrobial agent.

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**3,819,620**

**7-(D-α-AMINO - 1,4 - CYCLOHEXADIEN-1-YLACETAMIDO)DESACETOXYCEPHALOSPORANIC ACID DIHYDRATE**

**Friedrich Dürsch, Hopewell, and Theodore Michael Siewarga, Parlin, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.**

**No Drawing. Filed June 1, 1972, Ser. No. 258,767**
**Int. Cl. C07d** *99/24*
**U.S. Cl. 260—243 C** **10 Claims**

7 - (D - α - amino-1,4-cyclohexadien-1-ylacetamido) desacetoxy-cephalosporanic acid dihydrate, its methods of preparation and pharmaceutical compositions containing said compound.

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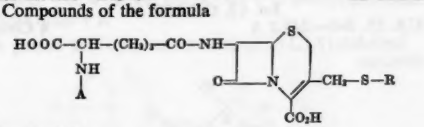
**3,819,621**

**3-SUBSTITUTED-THIOMETHYL-3-CEPHEM-4-CARBOXYLIC ACID DERIVATIVES**

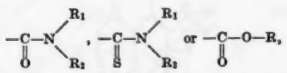
**Akira Morimoto, Matsubara, Kazuo Kariyone, Kyoto, Masaru Kurita, Takatsuki, Masashi Hashimoto, Toyonaka, and Osamu Nishiwaki, Takatsuki, Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan**

**No Drawing. Filed Dec. 8, 1971, Ser. No. 206,191**
**Claims priority, application Japan, Dec. 30, 1970, 46/129,467; June 19, 1971, 46/44,088**
**Int. Cl. C07d** *99/24*
**U.S. Cl. 260—243 C** **11 Claims**

Compounds of the formula



wherein A is



wherein $R_1$ and $R_2$ are hydrogen or various alkyl or aryl groups, $R_3$ is lower alkyl, and R is a thiadiazolyl, substituted thiadiazolyl or alkyl-1H-tetrazolyl are useful intermediates in the preparation of cephalosporin compounds having antimicrobial activity.

3,819,622

## METHOD OF PRODUCING 7β - ACYLAMIDO-3-METHYLCEPH-3-EM - 4 - CARBOXYLIC ACID ESTERS

**Brian Richard Cowley, Greenford, William Graham, Pinner, David Cedric Humber, Greenford, Lewis Aubrey Wetherill, North Wembley, and William James White, London, England, assignors to Glaxo Laboratories Limited, Greenford, England**

**No Drawing. Continuation of abandoned application Ser. No. 18,285, Mar. 10, 1970. This application July 17, 1972, Ser. No. 272,199**

**Claims priority, application Great Britain, Mar. 11, 1969, 12,865/69**

**Int. Cl. C07d *99/24***

**U.S. Cl. 260—243 C** **10 Claims**

The invention relates to a process for the preparation of 7β - acylamido - 3 - methylceph-3-em-4-carboxylic acid esters from 6β - acylamido - penicillanic acid 1-oxide esters in the presence of an acid catalyst in advantageous yields by careful selection of the solvent used in the reaction, the acid catalyst and the temperative and duration of the reaction.

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3,819,623

## 3,7-DISUBSTITUTED CEPHALOSPORIN COMPOUNDS

**Tadayoshi Takano, Hirakata, Masaru Kurita, Takatsuki, Hiroo Nikaido, Ikeda, Masashi Mera, Amagasaki, Nobukiyo Konishi, Kyoto, and Ritsuko Okui, Takatsuki, Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Higashiku, Osaka, Japan**

**Continuation-in-part of application Ser. No. 721,082, Apr. 12, 1968, now Patent No. 3,516,997. This application Oct. 23, 1969, Ser. No. 868,834**

**The portion of the term of the patent subsequent to June 23, 1987, has been disclaimed**

**Int. Cl. C07d *99/24***

**U.S. Cl. 260—243 C** **2 Claims**

The cephalosporin compound of this invention is the sodium salt of 7-(1H-tetrazol-1-ylacetamido)-3-(5-methyl-1,3,4 - thiadiazol-2-yl-thiomethyl)-3-cephem-4-carboxylic acid in the form of the hydrates containing 5 molecules of water and 3/2 molecules of water and in amorphous form. Said novel salts can be stored for a prolonged period of time without any loss in potency when used therapeutically against a number of microorganisms including gram-positive and gram-negative bacteria. Furthermore a number of highly effective antibacterial 7-acylated amino-3-(thiolated methyl)ceph-3-em-4-carboxylic acids and their salts are described.

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3,819,624

## ISOINDOLO[7,1,2-hij]QUINOLINES

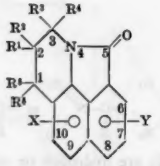
**Seymour D. Levine, North Brunswick, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.**

**No Drawing. Filed Jan. 3, 1972, Ser. No. 215,189**

**Int. Cl. C07d *27/30***

**U.S. Cl. 260—247.2 A** **4 Claims**

Isoindolo[7,1,2-hij]quinolines are provided having the structure



wherein $R^5$ can be hydroxyl, halogen, substituted amino, alkoxy, acyloxy, aroyloxy, substituted amido, and amino-substituted amido; and $R^6$ is hydrogen; and $R^5$ and $R^6$ can be taken together to form =O; X, Y, $R^1$, $R^2$, $R^3$ and $R^4$ are as defined below; and which are anti-inflammatory agents, central nervous system depressants, inhibitors of cyclic AMP phosphodiesterase and sun-screening agents.

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3,819,625

## MORPHOLINO-SUBSTITUTED-2-AMINOBENZOPHENOMIMINES

**Hans Ott, Basel-Land, Switzerland, assignor to Sandoz, Inc., Hanover, N.J.**

**No Drawing. Original application Aug. 13, 1969, Ser. No. 849,863, now Patent No. 3,642,791. Divided and this application Sept. 1, 1971, Ser. No. 177,154**

**Int. Cl. C07d *87/40***

**U.S. Cl. 260—247.5 R** **5 Claims**

Disclosed are compounds of the class of morpholino-substituted 1-substituted-4-aryl-2(1H)-quinazolinones useful as pharmaceutical agents, e.g., as anti-inflammatory agents.

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3,819,626

## SUBSTITUTED TRIAZINES

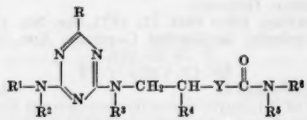
**John W. Kobzina, Walnut Creek, Calif., assignor to Chevron Research Company, San Francisco, Calif.**

**No Drawing. Filed Sept. 11, 1972, Ser. No. 288,245**

**Int. Cl. C07d *55/20***

**U.S. Cl. 260—249.8** **9 Claims**

Triazines of the formula



wherein R is chlorine, methoxy or methylthio; $R^1$ is alkyl, alkenyl or alkoxyalkyl; $R^2$, $R^3$, $R^4$ and $R^5$ are hydrogen or alkyl; $R^6$ is alkyl, aryl or haloaryl; and Y is oxygen or sulfur, are useful as herbicides.

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3,819,627

## 1-SUBSTITUTED-3,4-DIHYDRO-2(1H)-QUINAZOLINONES

**Hans Ott, Basel-Land, Switzerland, assignor to Sandoz-Wander, Inc., Hanover, N.J.**

**No Drawing. Continuation-in-part of abandoned application Ser. No. 741,807, July 1, 1968. This application Sept. 28, 1970, Ser. No. 76,222**

**The portion of the term of the patent subsequent to Oct. 9, 1990, has been disclaimed**

**Int. Cl. C07d *51/48***

**U.S. Cl. 260—251 QB** **12 Claims**

1-Substituted-3,4-dihydro - 2(1H) - quinazolinones from the group of 1-substituted-3,4-dihydro-4-aryl-2(1H)-quinazolinones and 1,3 - disubstituted - 3,4 - dihydro-4-aryl-2-(1H)-quinazolinones, which are useful because of pharmacological activity, for example, as anti-inflammatory agents. Also disclosed is process utilizing the 1-substituted-3,4-dihydro-4-aryl-2(1H)-quinazolinones as intermediates in preparation of 1-substituted - aryl-2(1H) - quinazolinones which are also useful as anti-inflammatory agents.

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3,819,628

## 2-PHENYL-4-SUBSTITUTED AMINO-QUINAZOLINES AND NITRATES THEREOF

**William R. Simpson, Mendham, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.**

**No Drawing. Filed July 31, 1972, Ser. No. 276,794**

**Int. Cl. C07d *51/48***

**U.S. Cl. 260—256.4 Q** **10 Claims**

Quinazolines substituted at the 2- position by a phenyl group and at the 4- position by an amino function bearing

a hydroxy-alkyl nitrate moiety, e.g., 4-(5-hydroxypentyl)-amino-2-phenyl-6,7-dimethoxy-quinazoline nitrate. The compounds have pharmacological activity in animals and are useful, for example, as anti-anginal agents and in the treatment of arrhythmia. Also disclosed are the corresponding hydroxy intermediates which are useful in preparation of the nitrates and also as anti-anginal agents or as agents in the treatment of arrhythmia.

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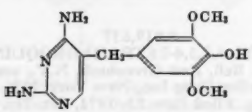
**3,819,629**
**METHOD FOR PREPARING 2,4-DIAMINO-5-(3,4,5-TRIMETHOXYBENZYL)PYRIMIDINE**

**Barbara Roth, Scarsdale, and Justina Strelitz, Dobbs Ferry, N.Y., assignors to Burroughs Wellcome & Co. (U.S.A.) Inc., Tuckahoe, N.Y.**

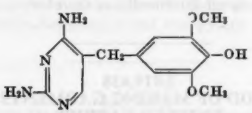
**No Drawing. Continuation of application Ser. No. 9,121, Feb. 10, 1970, which is a continuation of application Ser. No. 613,450, Feb. 2, 1967, both now abandoned. This application Aug. 6, 1971, Ser. No. 169,828**
**Claims priority, application Great Britain, Feb. 19, 1966, 7,376/66**
**Int. Cl. C07d** *51/42*
**U.S. Cl. 260—256.4 N** **8 Claims**

The method of preparing a compound I



(I)

wherein R is an alkyl group, or an unsaturated alkyl group, and wherein the alkyl groups may also bear halogen substitution by reacting a compound (II)



(II)

with an alkyl halide wherein R is defined as above. The invention also comprises compounds of formula (I) wherein R' is selected from the class consisting of an alkyl group having a halogen substitution and an unsaturated alkyl group.

Additionally, the term R in the formulas above may be an aralkyl group or an alkyl or alkoxy substituted aralkyl group.

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**3,819,630**
**3-(1-PIPERAZINYLALKYL) - 2,4-QUINAZOLINEDIONE COMPOUNDS AND METHODS FOR THEIR PRODUCTION**

**Robert F. Parcell, 3207 N. Wagner Road, Ann Arbor, Mich. 48103**

**No Drawing. Filed Aug. 21, 1972, Ser. No. 282,332**
**Int. Cl. C07d** *51/30*
**U.S. Cl. 260—256.5 R** **9 Claims**

3 - (1 - piperazinylalkyl)-2,4-quinazolinediones further substituted at the 4-position of the piperazine ring by *o*-ethylthiophenyl, *o*-propylthiophenyl, or *o*-isopropylthiophenyl; N-methyl derivatives; and acid-addition salts. The compounds are pharmacological agents, especially central nervous system depressants of the type known as major tranquilizing agents. They exhibit cerebral depressant activity and suppress conditioned avoidance behavior. The N-methylated derivatives can be produced by methylation of the corresponding unmethylated compounds with an N,N-di(lower alkyl)formamide dimethyl acetal. The unmethylated compounds can be produced by a ring closure reaction of an *o*-aminobenzamide compound with phosgene. Starting materials can be produced from various piperazine derivatives.

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**3,819,631**
**AZAPURINONES**

**Barbara Joyce Broughton, Croydon, Bryan John Large, Upminster, Stuart Malcolm Marshall, Stanford-le-Hope, David Lord Pain, Upminster, and Kenneth Robert Harry Wooldridge, Brentwood, England, assignors to May & Baker Limited, Dagenaham, Essex, England**

**No Drawing. Filed Dec. 14, 1971, Ser. No. 207,986**
**Claims priority, application Great Britain, Dec. 15, 1970, 59,552/70, 59,556/70; Oct. 26, 1971, 49,756/71; Nov. 17, 1971, 53,457/71**
**Int. Cl. C07d** *51/46*
**U.S. Cl. 260—256.4 F** **6 Claims**

8-Azapurin-6-ones substituted in the 2-position by an unsubstituted or substituted phenyl or naphthyl group, or by an alkenyl or alkynyl group, a cycloalkyl group, an alkyl group containing 2 to 10 carbon atoms, or an alkyl group containing 1 to 10 carbon atoms carrying one or more substituents selected from halogen atoms and hydroxy, cycloalkyl, alkoxy, phenyl and substituted phenyl groups, and pharmaceutically acceptable salts thereof, possess pharmacological properties useful, for example, in the treatment of allergic bronchial asthma.

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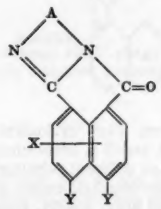
**3,819,632**
**NAPHTHOYLENE-BENZIMIDAZOLE AND NAPHTHALOPERINONE**

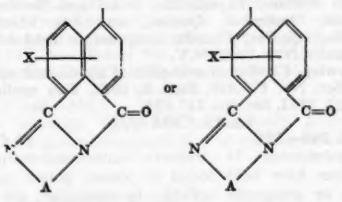
**Kurt Burdeska, Basel, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland**

**No Drawing. Filed Nov. 30, 1971, Ser. No. 203,485**
**Claims priority, application Switzerland, Dec. 1, 1970, 17,771/70**
**Int. Cl. C07d** *34/00*
**U.S. Cl. 260—282** **6 Claims**

Perinone dyestuffs of the formula



wherein A is phenylene or naphthalene, X is hydroxy, alkoxy of 1 to 4 carbon atoms, phenoxy, nitro or alkanoylamino of 1 to 4 carbon atoms, one Y is a hydrogen atom and the other Y is



wherein A and X have the meanings assigned to them hereinbefore are useful for coloring plastics in yellow shades of outstanding fastness properties.

3,819,633

## (ISO)QUINOLYL SULFONYLUREAS HAVING ANTIDIABETIC ACTIVITY

Vittorio Ambrogi, Bresso, and Willy Logemann, Marcantonio Parenti, and Raffaele Tommasini, Milan, Italy, assignors to Carlo Erba S.p.A., Milan, Italy

No Drawing. Filed Mar. 22, 1971, Ser. No. 126,893
Claims priority, application Italy, Apr. 1, 1970, 22,739/70; Sept. 16, 1970, 29,767/70; Jan. 25, 1971, 19,717/71, 19,718/71
Int. Cl. C07d *33/60, 35/42*
U.S. Cl. 260—283 SA 10 Claims

New acylamino-alkyl-benzensulfonyl ureas and process for their preparation are disclosed, for example N{4-[β-quinoline - 2 - carboxamido)ethyl]benzensulphonyl}-N'-cyclohexyl urea, N-(1-azacyclohept-1-yl)-N'-{4-[β-(quinoline-2-carboxamido)ethyl]benzensulphonyl} urea, N-{4-[β - (isoquinoline - 3 - carboxamido)ethyl]benzenesulphonyl}-N'-cyclohexyl urea, N-{4-[β-(quinoxaline-2-carboxamido)ethyl]benzenesulphonyl} - N' - cyclohexyl urea, N-(1 - azacycloheptyl - 1 - yl) - N' - {4-[β-(quinoxaline-2-carboxamido)ethyl]benzenesulphonyl} urea. These compounds are useful for their hypoglycemic activity.

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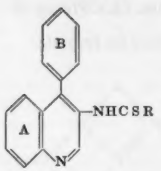
3,819,634

## 4-PHENYL-3-THIOACRYLAMINOQUINOLINES

Kanji Meguro, Takarazuka, Hiroshi Miyano, Nishinomiya, Yutaka Kuwada, Ashiya, Teruji Henmi, Amagasaki, and Togo Yamano, Yamatotakada, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

No Drawing. Filed July 20, 1971, Ser. No. 164,471
Claims priority, application Japan, July 23, 1970, 45/64,586
Int. Cl. C07d *33/50*
U.S. Cl. 260—283 S 17 Claims

Compounds of the formula




where R is hydrogen, alkyl, cycloalkyl, aralkyl or aryl and each of rings A and B is unsubstituted or substituted by 1–4 of the same or different substituents selected from halogen, nitro, trifluoromethyl, amino, alkylamino, alkylthio, lower alkyl and lower alkoxy, possess effective antitrichomonas and antiulcer activities, and low toxicity.

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3,819,635

## 14-HYDROXYMORPHINAN DERIVATIVES

Irwin J. Pachter, Fayetteville, N.Y., and Bernard R. Belleau, Westmont, Quebec, and Ivo Monkovic, Candiac, Quebec, Canada, assignors to Bristol-Myers Company, New York, N.Y.

No Drawing. Continuation-in-part of abandoned application Ser. No. 178,837, Sept. 8, 1971. This application Jan. 13, 1972, Ser. No. 217,633
Int. Cl. C07d *43/28*
U.S. Cl. 260—285 16 Claims

N - substituted - 14 - hydroxy-3-substituted-morphinan derivatives have been found to possess potent narcotic agonist or antagonist activity. In particular, the compound 3,14 - dihydroxy-N-cyclopropylmethylmorphinan has been found to possess potent narcotic antagonist activity. These compounds are prepared by total synthesis and are not derived from opium alkaloids.

3,819,636

## 4a,10-(METHANIMINOMETHANO) PHENANTHRENE DERIVATIVES

Karel Wiesner, Fredericton, New Brunswick, Canada, assignor to American Home Products Corporation, New York, N.Y.

No Drawing. Application Sept. 15, 1970, Ser. No. 72,508, now Patent No. 3,723,437, dated Mar. 27, 1973, which is a continuation-in-part of abandoned application Ser. No. 846,962, Aug. 1, 1969. Divided and this application Oct. 30, 1972, Ser. No. 302,376
Int. Cl. C07d *39/00*
U.S. Cl. 260—285 7 Claims

There are disclosed herein organic amines, and their pharmaceutically acceptable acid addition salts, which are 1,2,3,4,9,10 - hexahydro - 3,6-dimethoxy-α-methyl-α-alkyl- or aralkyl - 3,10a-etheno-4a,10-(methaniminomethano)phenanthrene-2-methanol and their corresponding N-(lower alkyl)derivatives. Process for the synthesis of these compound, which includes a facile preparation of the key intermediate, 3,4,9,10 - tetrahydro-6-methoxy-12-methyl-4a,10-(methaniminomethano)phenanthrene - 2,11 (2H)-dione, is also disclosed. The amines possesss analgesic, antibacterial and antifungal activities, and methods for their use are disclosed.

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3,819,637

## 1,2-DIPHENYL-1,2,3,4-TETRAHYDROQUINOLINES

Malcolm R. Bell, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

No Drawing. Filed June 23, 1971, Ser. No. 156,070
Int. Cl. C07d *33/10*
U.S. Cl. 260—288 R 13 Claims

The invention relates to novel 1-(4-$R_1$O-phenyl)-2-(4-$R_2$-phenyl)-6-$R_3$-1,2,3,4-tetrahydroquinolines having antifertility and hypocholesterolemic activities, to their preparation, and to novel intermediates therefor.

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3,819,638

## METHOD OF MAKING GARMENTS OF KNITTED FABRICS

Kiyoshi Ogawa, Hirakata, and Seiji Koyama and Takehiko Michihara, Ibaraki, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Oct. 18, 1971, Ser. No. 189,918
Claims priority, application Japan, Oct. 10, 1970, 45/92,212
Int. Cl. B29c *17/02*
U.S. Cl. 264—292 3 Claims

A method of making a garment which comprises mounting on a molding form so as to cover its side circumferential surface, a tubular knitted fabric opened at both ends, at least 30% of which is composed of a thermoplastic synthetic fiber, exerting a tension on the knitted fabric in the directions of its open ends to thereby decrease the dimensions of the tubular knitted fabric in

the direction of diameter until it fits to the side circumferential surface of the molding form, heat-setting the tubular knitted fabric under the application of such tension, and thereafter removing the molded fabric from the molding form.

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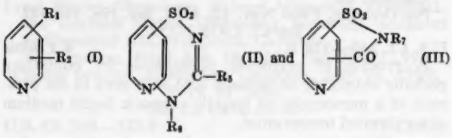
**3,819,639**

## 2-METATRIFLUOROMETHYLANILINO-PYRIDINE-5-N-ACETYL SULFONAMIDE

**Jacques E. Delarge, Dolembreux, Leopold Nicolas Joseph Victor Thunus, Liege, Charles-Leon Albert Lapiere, Tongeren, and Andre Henri Eugene Georges, Ottignies, Belgium, assignors to A. Christiaens Societe Anonyme, Brussels, Belgium**

**No Drawing. Filed Nov. 9, 1971, Ser. No. 197,139**
**Claims priority, application Great Britain, Nov. 11, 1970, 53,675/70**
**Int. Cl. C07d** *31/48*
**U.S. Cl. 260—294.8 F** **4 Claims**

Compounds of formulae



wherein $R_1$ represents a sulfonic acid, sulfonamido group when $R_2$ represents a substituted anilino group and $R_1$ represents in addition to the above-indicated groups, a cyano, carboxy or carboxamido group when $R_2$ represents a N-lower alkylpiperazino group; $R_5$ and $R_7$ represent each a lower alkyl group and $R_6$ represents hydrogen or a lower alkyl or aryl group; as well as the pharmaceutically acceptable salts thereof. These compounds have valuable anti-inflammatory and anti-pyretic properties.

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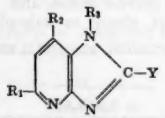
**3,819,640**

## AZA-BENZIMIDAZOLES AND PROCESS FOR THEIR PRODUCTION

**Walter von Bebenburg, Buchschlag, Germany, assignor to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany**

**No Drawing. Filed Aug. 7, 1972, Ser. No. 278,370**
**Int. Cl. C07d** *31/50*
**U.S. Cl. 260—294.8 C** **16 Claims**

There are produced 4-aza-benzimidazoles of the formula



where $R_1$ is fluorine, chlorine or bromine, $R_2$ is hydrogen or 1–6 carbon alkyl, $R_3$ is hydrogen, alkyl of 1–6 carbon atoms, alkyl of 1–6 carbon atoms having a phenyl substituent or $CH_2COX$ where X is amino, alkylamino having 1–6 carbon atoms, hydroxy or alkoxy of 1–6 carbon atoms, Y is a halogen, hydroxy, mercapto, amino, alkoxy of 1–6 carbon atoms, beta-hydroxyethylamino, phenylalkylamino in which the alkyl has 1–6 carbon atoms, alkylmercapto of 1–6 carbon atoms, alkylamino with 1–6 carbon atoms, phenyl amino, pyndylamino, alkyl with 1–6 carbon atoms, hydroxyalkyl with 1–6 carbon atoms, trifluoromethyl, phenylalkyl having 1–6 carbon atoms in the alkyl or $—SCH_2COX$, and pharmacologically acceptable salts thereof.

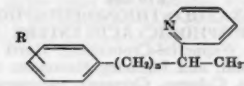
**3,819,641**

## 2-(2-PYRIDYL)-ω-PHENYLALKYLAMINES

**William John Welstead, Jr., and Burt Trosey Merriman, Jr., Richmond, Va., assignors to A. H. Robins Company, Incorporated, Richmond, Va.**

**No Drawing. Filed Oct. 2, 1972, Ser. No. 293,863**
**Int. Cl. C07d** *31/42*
**U.S. Cl. 260—296 R** **8 Claims**

Novel 2-(2-pyridyl)-ω-phenylalkylamines of the formula:



wherein Am is an amino radical selected from the group consisting of amino-($—NH_2$), di-lower-alkylamino, pyrrolidino, piperidino and morpholino; R is selected from the group consisting of hydrogen, fluorine, chlorine, bromine, methoxy and trifluoromethyl, *n* is a positive integer from 1 to 2 inclusive are prepared by (a) reacting 2-(ω-phenylakylpyridines with formaldehyde and secondary amines, and (b) lithium aluminum hydride reduction of α-benzyl-2-pyridylacetonitriles. The novel products are useful as antisecretory agents.

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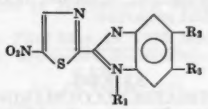
**3,819,642**

## 2-(5-NITRO-2-THIAZOLYL)-BENZIMIDAZOLES

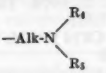
**Peter Strehlke and Ulrich Redmann, Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Germany**

**No Drawing. Filed June 23, 1972, Ser. No. 265,468**
**Claims priority, application Germany, Aug. 20, 1971, P 21 42 585.4**
**Int. Cl. C07d** *99/10*
**U.S. Cl. 260—302 H** **21 Claims**

This invention relates to 2-(5-nitro-2-thiazolyl)-benzimidazoles of the formula



wherein $R_1$ is hydrogen; alkyl; phenyl, benzyl; 2-phenylethyl; hydroxyalkyl; esterified hydroxyalkyl; or



wherein Alk is alkylene and $R_4$ and $R_5$ are alkyl; and $R_2$ and $R_3$ are each hydrogen, halogen, alkyl, alkoxy, trifluoromethyl or nitro. These compounds are useful fungicides.

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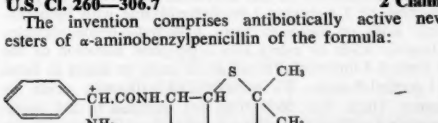
**3,819,643**

## ESTERS OF 6-AMINO PENICILLANIC ACID

**Erling Kund Frederiksen, Holte, and Wagn Ole Godtfredsen, Vaerlose, Denmark, assignors to Lovens Kemiske Fabrik Produktionsaktieselskab, Ballerup, Denmark**

**No Drawing. Original application Sept. 26, 1968, Ser. No. 762,987, now Patent No. 3,697,507. Divided and this application Dec. 22, 1971, Ser. No. 211,114**
**Int. Cl. C07d** *99/16*
**U.S. Cl. 260—306.7** **2 Claims**

The invention comprises antibiotically active new esters of α-aminobenzylpenicillin of the formula:



(I)

in which the asterisk indicates an asymmetric carbon atom; *n* is an integer from 0 to 5; and A is an unsubstituted or substituted aliphatic, alicyclic, aromatic, or heterocyclic radical; the salts of said esters with pharmaceutically acceptable acids; and methods of preparing the esters and salts.

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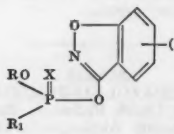
**3,819,644**
**BENZISOXAZOLO(THIONO)PHOSPHORIC (PHOSPHONIC) ACID ESTERS**

**Walter Lorenz, Wuppertal-Cronenberg, Horst Boshagen, Haan-Rhineland, and Ingeborg Hammann and Wolfgang Behrenz, Cologne, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany**

**No Drawing. Filed Sept. 1, 1971, Ser. No. 177,084**
**Claims priority, application Germany, Sept. 7, 1970, P 20 44 194.5**
**Int. Cl. C07d *85/48***
**U.S. Cl. 260—307 D** **5 Claims**

Benzisoxazolo(thiono)phosphoric(phosphonic) acid esters of the general formula:



(I)

in which

X is oxygen or sulfur,
R is an alkyl radical with 1–6 carbon atoms,
$R_1$ is an alkyl or alkoxy radical with 1–6 carbon atoms, and
*n* is 1 or 2,

which possess insecticidal, acaricidal, tickicidal, nematocidal and fungicidal properties.

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**3,819,645**
**V-TRIAZOLYLCOUMARINS**

**Rudolf Kirchmayr, Binningen, Basel-Land, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.**

**No Drawing. Continuation of abandoned application Ser. No. 69,149, Sept. 2, 1970. This application Mar. 5, 1973, Ser. No. 337,781**
**Int. Cl. C07d *99/04*; C09k *1/02***
**U.S. Cl. 260—308 B** **2 Claims**

New 3-phenyl-7-v-triazolylcoumarins are optical brighteners of organic materials. They are prepared by condensing oxime hydrazones which are produced by reacting 1,1-dialkyl-2-oximino-indan-3-ones and 3-phenyl-7-hydrazinocoumarins.

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**3,819,646**
**(1-METHYL-5-NITRO-2-IMIDAZOLYL)THIOALKANOIC ACIDS AND DERIVATIVES**

**Robert C. Tweit, Wilmette, Ill., assignor to G. D. Searle & Co., Chicago, Ill.**

**No Drawing. Filed Nov. 20, 1972, Ser. No. 308,060**
**Int. Cl. C07d *49/36***
**U.S. Cl. 260—309** **8 Claims**

The compounds of this invention are prepared by the reaction of 2-mercapto-1-methylimidazole with haloalkanoic acids or esters to form 1-methyl-2-imidazolylthioalkanoic acids or esters and subsequent nitration of the 1-methyl-2-imidazolylthioalkanoic acids or esters to form (1-methyl-5-nitro - 2 - imidazolyl)thioalkanoic acids or esters. These thio derivatives are oxidized to the corresponding sulfinyl and sulfonyl derivatives. The compounds of this invention are potent anti-protozoal agents and are angiotensin antagonists.

**3,819,647**
**WATER-SOLUBLE SALTS OF IMIDAZOLINES WITH PHOSPHORIC ACID ESTERS OF (A) ETHOXYLATED LONG CHAIN ALCOHOLS AND (B) ETHOXYLATED ALKYL PHENOLS**

**John T. Foley, Readington Township, N.J., assignor to Witco Chemical Corporation, New York, N.Y.**

**No Drawing. Continuation-in-part of abandoned application Ser. No. 864,883, Oct. 8, 1969. This application Feb. 28, 1972, Ser. No. 230,031**
**Int. Cl. C07d *49/34***
**U.S. Cl. 260—309.6** **6 Claims**

Imidazoline salts of phosphoric acid mono- and diesters of (a) ethoxylated long chain monohydric alkanols and (b) ethoxylated alkyl monohydric phenols, said salts being water-soluble and causing viscosity building in aqueous systems.

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**3,819,648**
**PRODUCTION OF PHTHALIMIDE**

**Werner R. Boehme, Glen Ellyn, and Robert G. Agusto, Chicago, Ill., assignors to Dawe's Laboratories, Inc., Chicago, Ill.**

**No Drawing. Filed Nov. 12, 1971, Ser. No. 198,442**
**Int. Cl. C07d *27/52***
**U.S. Cl. 260—326 R** **8 Claims**

A process of preparing phthalimide by contacting phthalic anhydride or phthalic acid with urea in the presence of a monocyclic or bicyclic aromatic liquid medium at an elevated temperature.

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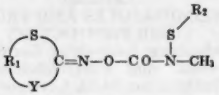
**3,819,649**
**N-METHYL N-SULFENYLATED OXIME CARBAMATES**

**Gerhard Zumach, Peter Siegle, and Ingeborg Hammann, Cologne, and Paul-Ernst Frohberger, Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany**

**No Drawing. Filed Jan. 9, 1973, Ser. No. 322,266**
**Claims priority, application Germany, Jan. 22, 1972, P 22 03 050.8**
**Int. Cl. C07d *71/00, 89/06***
**U.S. Cl. 260—327 M** **8 Claims**

N-methyl N-sulfenylated oxime carbamates of the formula



(I)

in which

Y is S or O,
$R_1$ is alkylene of 2 or 3 carbon atoms which may be substituted by alkyl or aryl, preferably phenyl or lower alkyl of 1 to 4 carbon atoms, and
$R_2$ is trihalomethyl, phenyl or halo-phenyl,

which possess insecticidal, acaricidal and fungicidal properties.

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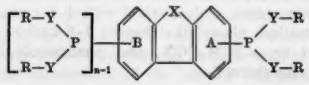
**3,819,650**
**ORGANOPHOSPHORUS BENZOFURAN AND BENZOTHIOPHENE COMPOUNDS**

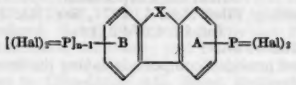
**Kurt Hofer, Munchenstein, Basel-Land, and Guenther Tscheulin, Riehen, Basel-Land, Switzerland, assignors to Sandoz Ltd. (also known as Sandoz AG), Basel, Switzerland**

**No Drawing. Filed Mar. 27, 1972, Ser. No. 238,640**
**Claims priority, application Switzerland, Apr. 2, 1971, 4,864/71**
**Int. Cl. C07d *5/44, 63/24***
**U.S. Cl. 260—329.3** **27 Claims**

The invention provides novel compounds of formula I,



in which $n$ is 1 or 2, X is a sulphur or oxygen atom, the Y's independently signify oxygen, sulphur, imino or alkyl- or cycloalkyl-imino, and the R's independently signify a hydrocarbon radical consisting of aromatic and/or saturated aliphatic units, and the rings A and/or B may optionally contain an alkyl substituent. The compounds are useful as stabilisers for organic materials against light, heat and oxygen. The invention also provides the novel intermediates of formula II,



in which $n$, X and the rings A and B are as defined above and Hal signifies a chlorine or bromine atom.

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**3,819,651**
**PROCESS FOR THE PRODUCTION OF TETRAHYDROTHIOPHENE**
**Ernst Worbs, Obernburg, Helmut Magerlein, Erlenbach, and Gerhard Meyer, Obernburg, Germany, assignors to Glanzstoff AG, Wuppertal, Germany**
**No Drawing. Filed July 10, 1970, Ser. No. 53,998**
**Claims priority, application Germany, July 18, 1969, P 19 36 565.2**
**Int. Cl. C07d** *63/02*
**U.S. Cl. 260—332.8** **11 Claims**

Process for the production of tetrahydrothiophene in high yields by reacting tetrahydrofuran with hydrogen sulfide at an elevated temperature, preferably in an approximately equimolar ratio, while employing as the essential catalyst a silica coated aluminum oxide.

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**3,819,652**
**REDUCTION OF SULFONES**
**John Nicholson Gardner, Garrison, N.Y., assignor to Hoffmann-La Roche Inc., Nutley, N.J.**
**No Drawing. Filed Sept. 18, 1972, Ser. No. 289,899**
**Int. Cl. C07d** *63/10*
**U.S. Cl. 260—332.8** **2 Claims**

A process for reducing organic sulfones to organic sulfides by utilizing di(lower alkyl)aluminum hydrides.

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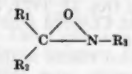
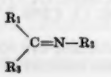
**3,819,653**
**METHOD FOR PREPARING OXAZIRIDINES**
**Jean-Pierre Schirmann, Brignais, and Francis Weiss, Pierre-Benite, France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France**
**No Drawing. Filed Oct. 28, 1971, Ser. No. 193,564**
**Claims priority, application France, Oct. 30, 1970, 7039204**
**Int. Cl. C07d** *1/00*
**U.S. Cl. 260—333** **10 Claims**

This invention relates to a method for preparing oxaziridines of the general formula



(I)

wherein $R_1$ and $R_2$ each is a hydrogen atom, or a non-substituted or substituted linear or branched alkyl or cycloalkyl radical having a maximum of 10 carbon atoms, or a non-substituted or substituted phenyl radical, substitution being with one or more groups which are stable under the conditions of the reaction whereby said oxaziridines (I) are produced or $R_1$ and $R_2$ together is a linear or branched alkylene radical of from 3 to 11 carbon atoms which comprises reacting an imine of the general formula



(II)

with hydrogen peroxide and a nitrile of the general formula

$$R_4—CN \qquad (III)$$

wherein $R_1$ and $R_2$ have the aforesaid meaning and $R_3$ and $R_4$ each is a non-substituted or substituted linear or branched alkyl or cycloalkyl radical having a maximum of 10 carbon atoms or a non-substituted or substituted phenyl radical, substitution being with one or more groups which are stable under the conditions whereby said oxaziridines (I) are produced and recovering said oxaziridines (I) from the reaction medium.

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**3,819,654**
**UNSATURATED ETHER SUBSTITUTED XANTHONE CARBOXYLIC ACID COMPOUNDS**
**Jurg R. Pfister, Los Altos, and Ian T. Harrison and John H. Fried, Palo Alto, Calif., assignors to Syntex Corporation, Apartado, Panama**
**No Drawing. Filed Sept. 25, 1972, Ser. No. 291,617**
**Int. Cl. C07d** *7/44*
**U.S. Cl. 260—335** **14 Claims**

Compositions containing and methods employing, as the essential ingredient(s), novel unsaturated ether substituted xanthone carboxylic acid compounds which are useful in the treatment of allergic conditions. Methods for preparing these compounds and compositions and intermediates therein are also disclosed. 7-Allyloxy-xanthone-2-carboxylic acid and 5-(propargylthio)-xanthone-2-carboxylic acid are illustrated as representative of the class.

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**3,819,655**
**BENZODIOXANE DERIVATIVES**
**Madhukar Subraya Chodnekar, Basel, Albert Pfiffner, Pfaffhausen, Norbert Rigassi, Arlesheim, Ulrich Schwieter, Reinach, and Milos Suchy, Pfaffhausen, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.**
**No Drawing. Filed Mar. 15, 1972, Ser. No. 235,000**
**Claims priority, application Switzerland, Mar. 23, 1971, 4,258/71**
**Int. Cl. C07d** *15/18*
**U.S. Cl. 260—340.3** **3 Claims**

2-{[(alkenyl, alkynyl or alky)oxy]methyl}-1,4-benzodioxane derivatives, useful as insect hormonal agents and insecticide compositions containing these derivatives alone or in combination with conventional insect poisons.

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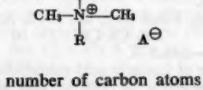
**3,819,656**
**UNIFORM MIXTURES OF QUATERNARY AMMONIUM SALT ISOMERS**
**Walter P. Barie, Jr., Shaler Township, Allegheny County, Norman W. Franke, Penn Hills Township, Allegheny County, and Stanley C. Paviak, Shaler Township, Allegheny County, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.**
**No Drawing. Continuation-in-part of application Ser. No. 787,241, Dec. 26, 1968, now Patent No. 3,591,563. This application Nov. 6, 1970, Ser. No. 87,650**
**Int. Cl. C07c** *87/04*
**U.S. Cl. 260—343.7** **2 Claims**

Isomeric quaternary ammonium salt mixtures of the various individual compounds represented by the following formula:



wherein the total number of carbon atoms in the linear paraffin chain is from about 8 to about 22; wherein $x$ is a whole number from about 0 to 19 and $y$ is a whole

number from about 0 to 19; wherein R is lower alkyl, lower alkenyl, cycloalkyl, heterocyclic, or aryl, and A is an anion of an acid. These compounds are mixtures of substantially equal amounts of the various monoamine isomers wherein the monoamine is attached to different internal carbon atoms. The compounds are used as effective antistatic agents for plastics and as germicides.

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3,819,657

## METHYLATION OF TOCOPHEROLS

**William S. Baldwin, Minneapolis, and Kenneth W. Keeney, St. Paul, Minn., assignors to General Mills Chemicals, Inc.**

**No Drawing. Filed Oct. 20, 1972, Ser. No. 299,482**
**Int. Cl. C07d** *7/22*
**U.S. Cl. 260—345.5** **7 Claims**

Tocopherols are converted to α-tocopherol using formaldehyde in the presence of an orthophosphoric acid catalyst with catalytic hydrogenation.

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3,819,658

## ISOMERIZATION OF TETRAHYDROPHTHALIC ANHYDRIDE

**William T. Gormley, Pittsburgh, Pa., and Ben B. Corson, Milwaukee, Wis., assignors to Koppers Company, Inc.**

**No Drawing. Filed Mar. 10, 1971, Ser. No. 123,076**
**Int. Cl. C07c** *61/24*
**U.S. Cl. 260—346.3** **13 Claims**

Tetrahydrophthalic anhydride is isomerized in the presence of a catalytic amount of rhodium.

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3,819,659

## TRIMELLITIC ACID ANHYDRIDE RECOVERY FROM LIQUID PHASE OXIDATION OF PSEUDOCUMENE

**Richard H. Baldwin, Oak Lawn, Donald E. Burney, Naperville, and Philip H. Towle, Lombard, Ill., and Donald G. Micklewright, Broadview Heights, Ohio, assignors to Standard Oil Company, Chicago, Ill.**

**No Drawing. Filed Aug. 27, 1971, Ser. No. 175,696**
**Int. Cl. C07c** *63/32*
**U.S. Cl. 260—346.4** **7 Claims**

Substantially all trimellitic acid equivalent as its acid anhydride (intra-molecular anhydride) is recovered from effluent from liquid phase oxidation of pseudocumene (1,2,4-trimethylbenzene) by crystallizing acid anhydride from a ketone or an aromatic hydrocarbon solution of a mixture of partially purified acid anhydride and materials boiling lower than said acid anhydride obtained as an overhead fraction from flash distillation of total oxidation effluent whose trimellitic acid content has been thermally converted to crude acid anhydride. Such processing of oxidation effluent avoids subjecting oxidation effluent to crystallization, which leaves up to 35% or more trimellitic acid as solute in mother liquor requiring separate recovery of trimellitic acid from mother liquor, and processing of mother liquor to recover a portion of said solute to effect more efficient recovery of total trimellitic acid content of oxidation effluent.

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3,819,660

## ALKENYLSUCCINIC ANHYDRIDE PREPARATION

**Paul J. Cahill, Lombard, and Adam S. Kurasiewicz, Wheaton, Ill., assignors to Standard Oil Company, Chicago, Ill.**

**No Drawing. Filed Dec. 22, 1972, Ser. No. 317,673**
**Int. Cl. C07c** *55/10*
**U.S. Cl. 260—346.8 R** **9 Claims**

Suppression of fumaric acid sublimation and tar formation during reaction of 168 to 900 M.W. alkene with maleic anhydride and increased yield of alkenylsuccinic anhydride are achieved by the use of catalytic amount of p-alkylbenzenesulfonic acid, especially p-toluenesulfonic acid and 1–3 weight parts of acetic anhydride per weight part of the sulfonic acid during said reaction.

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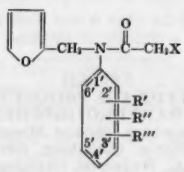
3,819,661

## 2-CHLORO-N-FURFURYL OR TETRAHYDROFURFURYLACETANILIDES AND RING SUBSTITUTED DERIVATIVES

**Lester L. Maravetz, Westfield, N.J., assignor to Mobil Oil Corporation**

**No Drawing. Filed Nov. 1, 1971, Ser. No. 194,521**
**Int. Cl. C07d** *5/16*
**U.S. Cl. 260—347.3** **6 Claims**

There are provided compounds having the formulae:



and the corresponding N-tetrahydrofurfuryl compounds, wherein X is halogen (Cl or Br) and R', R'' and R''' are $C_1$–$C_6$ alkyl, $C_1$–$C_6$ alkoxy, $C_1$–$C_6$ alkylthio, $C_1$–$C_6$ alkylsulfinyl, $C_1$–$C_6$ alkylsulfonyl, halo cyano, $C_1$–$C_3$ alkoxycarbonyl, acetoxy, acetyl, and trifluoromethyl. These compounds are useful as pre-emergence herbicides.

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3,819,662

## METHOD FOR STABILIZING GLYCIDOL

**Stephen E. Cantor, Cheshire, Conn., Gordon Dwight Brindell, Crystal Lake, Ill., and Robert John Quint, Naugatuck, Conn., assignors to Uniroyal, Inc., New York, N.Y.**

**No Drawing. Filed Feb. 18, 1972, Ser. No. 227,598**
**Int. Cl. C07d** *1/18*
**U.S. Cl. 260—348 R** **3 Claims**

Unstable glycidol and glycidol-type compounds are stabilized by reacting them with acrylonitrile, acrylonitrile-type compounds, or both, in the presence of catalytic amounts of organic bases, particularly strong organic bases, to produce a stable cyanoalkylepoxy ether. The glycidol and glycidol-type compounds are readily recovered in essentially pure form by heating the ether in contact with the basic catalysts described above.

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3,819,663

## CATALYST RECYCLE

**Irving E. Levine, 41 Thornwood Road, Stamford, Conn. 06903; Harold A. Huckins, 56 Finley Road, R.F.D. 2, Princeton, N.J. 08540; and Stanley Herzog, 91 Engle St., Tenafly, N.J. 07670**

**No Drawing. Filed Oct. 27, 1971, Ser. No. 193,161**
**Int. Cl. C07d** *1/08*
**U.S. Cl. 260—348.5 L** **2 Claims**

The present invention relates to the catalytic epoxidation of olefinic materials using organic hydroperoxide epoxidizing agents and is particularly directed to novel procedures for the recovery and recycle of the epoxidation catalyst.

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3,819,664

## POLYCYCLIC DYES

**Malcolm B. Burleigh, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.**

**No Drawing. Filed Sept. 13, 1971, Ser. No. 180,173**
**Int. Cl. C09b** *3/22*
**U.S. Cl. 260—356** **6 Claims**

Novel polycyclic aromatic dye compounds are provided comprising at least two moieties in conjugate relationship

as part of a single chromophore, each moiety comprising three linearly kata condensed six-membered aromatic rings with solubilizing groups attached to each moiety. At least one auxochromic group comprising an atom having an atomic weight of at least 31 is bonded to the chromophore portion of the compound by means of said atom.

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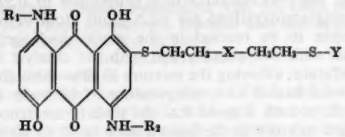
**3,819,665**

## ANTHRAQUINONE DYESTUFFS WHICH ARE SPARINGLY SOLUBLE IN WATER

**Hans Bosshard, Basel, Switzerland, Michael Diamantoglou, Erlenbach, Germany, and Hans Peter Koelliker, Munchenstein, and Urs Karlen, Magden, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland**

**No Drawing. Filed July 6, 1971, Ser. No. 160,206**
**Claims priority, application Switzerland, July 6, 1970, 10,162/70**
**Int. Cl. C09b** *1/56*
**U.S. Cl. 260—376** **5 Claims**

Anthraquinone dyestuffs of the formula



(I)

in which $R_1$ and $R_2$ independently of one another each denote hydrogen or a lower alkyl group, X denotes a direct bond, $—CH_2—$, —O— or —S—, and Y denotes the nitrile group, a thiocarboxylic acid ester group, a carbacyl group, or an optionally substituted aliphatic, cycloaliphatic, carbocyclic-aromatic or heterocyclic radical.

The dyestuffs yield fast blue shades on polyester fibers.

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**3,819,666**

## PERFLUOROALKYL CARBOXYLIC ACIDS

**Eduard K. Kleiner, New York, and Robert A. Falk, New City, N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.**

**No Drawing. Filed Aug. 16, 1972, Ser. No. 281,085**
**Int. Cl. C08h** *3/00*
**U.S. Cl. 260—402.5** **4 Claims**

Novel perfluoroalkyl group containing acids and esters or anhydrides thereof are disclosed with utility as intermediates for the synthesis of polymers or salts such as chromium complexes having oil and water repellent properties. The novel acids are obtained by the addition of mercapto acids to perfluoroalkyl group containing esters of fumaric, maleic, citraconic, mesaconic, itaconic, methylene malonic or aconitic acids.

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**3,819,667**

## HYDROXY SUBSTITUTED UNSATURATED ACIDS AND ESTERS AND DERIVATIVES THEREOF

**John B. Siddall, Palo Alto, Calif., and Jean Pierre Calame, Locarno, Switzerland, assignors to Zoecon Corporation, Palo Alto, Calif.**

**No Drawing. Application July 22, 1969, Ser. No. 843,818, now Patent No. 3,671,558, dated June 20, 1972, which is a continuation-in-part of application Ser. No. 800,266, Feb. 18, 1969, which is a continuation-in-part of application Ser. No. 618,351, Feb. 24, 1967, which in turn is a continuation-in-part of application Ser. No. 590,195, Oct. 29, 1966, all now abandoned. Divided and this application Mar. 19, 1971, Ser. No. 126,298**
**Int. Cl. A01n** *9/24;* **C07c** *59/18, 69/66*
**U.S. Cl. 260—405** **20 Claims**

Aliphatic acids and esters having a backbone of at least 12 carbon atoms lower alkyl at C–3, C–7, and C–11 unsaturation at C–2,3 and substituted at C–11 or C–7,11 with hydroxy and esters and ethers thereof which are useful arthropod maturation inhibitors.

**3,819,668**

## PERFLUOROALKYLALKYLMONOCARBOXYLIC ACID ESTERS

**Horst Jaeger, Bettingen, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland**

**No Drawing. Filed Feb. 3, 1971, Ser. No. 112,474**
**Claims priority, application Switzerland, Feb. 9, 1970, 1,824/70**
**Int. Cl. C07c** *69/62;* **D06m** *15/48*
**U.S. Cl. 260—408** **10 Claims**

Perfluoroalkylalkylmonocarboxylic acid esters are provided which are derived from perfluoro-acids and aliphatic epoxides. These esters contain at least one perfluoroalkyl radical with 4 to 14 carbon atoms, which is bonded over an alkylene bridge with 1 to 10 carbon atoms to the carboxyl group, which carboxyl group is esterified with an epoxide containing further condensable groups in the terminal position such as halogen atoms or a hydroxyl group.

The perfluoroalkylalkylmonocarboxylic acid esters are used for treating porous or non porous substrates, preferably for the production of oleophobic furnishes above all on fibrous materials such as textiles and papers.

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**3,819,669**

## PROCESS FOR PREPARING LINEAR FATTY ACIDS BY CARBOXYLATION OF OLEFINS

**John F. Knifton, Poughquag, N.Y., assignor to Texaco Inc., New York, N.Y.**

**No Drawing. Filed Feb. 2, 1972, Ser. No. 223,015**
**Int. Cl. C07c** *67/00, 51/14*
**U.S. Cl. 260—410.9 R** **22 Claims**

This invention concerns a process for preparing linear fatty acids and esters from alpha-olefins and carbon monoxide in the presence of homogeneous platinum complexes.

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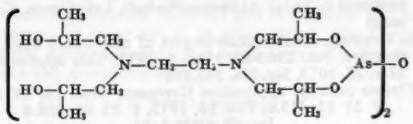
**3,819,670**

## 1-(BIS(2-HYDROXYPROPYL)-NITRILOETHYLENE)-5-ARSA - 1 - AZA - 4,6 - DIOXACYCLOOCTYL ARSENIC ETHER

**Woodrow E. Kemp, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.**

**No Drawing. Original application Jan. 26, 1972, Ser. No. 221,080, now Patent No. 3,764,377. Divided and this application July 16, 1973, Ser. No. 379,269**
**Int. Cl. C07f** *9/68*
**U.S. Cl. 260—440** **1 Claim**

A wood preservative composition comprised of creosote in which is dissolved the novel arsenic-containing compound 1 - (bis(2-hydroxypropyl)nitriloethylene)-5-arsa-1-aza-4,6-dioxacyclooctyl As-ether whose structure is



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**3,819,671**

## DIOXALUMININ AND DIOXALUMINANE COMPOUNDS AND THEIR PREPARATION

**Claude Bouillon, Eaubonne, Pierre Dufaure, Paris, and Georges Rosenbaum, Asnieres, France, assignors to Societe Anonyme dite: L'Oreal, Paris, France**

**No Drawing. Filed Oct. 4, 1972, Ser. No. 294,927**
**Int. Cl. C07f** *5/06*
**U.S. Cl. 260—448 AD** **7 Claims**

An antiperspirant composition contains in a cosmetic carrier as an active compound a dioxaluminin or dioxaluminane derivative.

3,819,672

## FOAMING UNSATURATED POLYESTER RESINS

Wallace G. Joslyn, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

No Drawing. Filed July 12, 1971, Ser. No. 162,017
Int. Cl. C07f 7/10
U.S. Cl. 260—448.2 N 10 Claims

Unsaturated polyester resin foams are prepared with the aid of a profoamer which is a copolymer consisting essentially of (a) $SiO_2$ units, (b) $(CH_3)_3SiO_{1/2}$ units and

(c) $R_2—N—R'—Si(R'')_nO_{\frac{3-n}{2}}$

units wherein $n$ has a value from 0 to 2, R'' is an alkyl radical containing from 1 to 18 carbon atoms, R' is an alkylene radical containing from 1 to 18 carbon atoms and each R is selected from the group consisting of the hydrogen atom, alkyl radicals containing from 1 to 18 carbon atoms and aminoalkyl radicals containing from 2 to 18 carbon atoms, the ratio of the (b) units to the sum of the (a) and (c) units in the copolymer being in the range of 0.4:1 to 1.2:1.

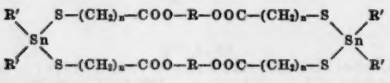
3,819,673

## PROCESS FOR THE POLYCONDENSATION OF ORGANOSILICON COMPOUNDS IN THE PRESENCE OF TIN CATALYST

Ferenc Sagi, Bron, and Michel Roussos, Lyon, France, assignors to Rhone-Poulenc S.A., Paris, France

No Drawing. Filed Mar. 23, 1972, Ser. No. 237,514
Claims priority, application France, Mar. 24, 1971, 7110383
Int. Cl. C07f 7/02, 7/08, 7/18
U.S. Cl. 260—448.2 E 10 Claims

Organosilicon compounds containing a Si—OH group are polycondensed using cyclic organothio-tins of high catalytic activity of formula



in which the symbols R, independently represent a divalent hydrocarbon radical or a divalent radical consisting of divalent hydrocarbon radicals bonded by —O—, —CO—, —COO— or —CHOH— radicals, the symbols R', independently represent monovalent hydrocarbon radicals and $n$ represents a positive integer.

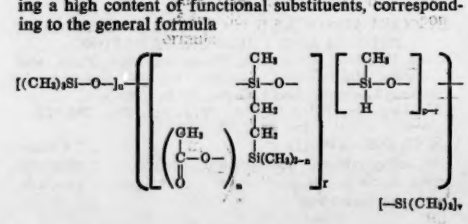
3,819,674

## PROCESS FOR THE PRODUCTION OF ACETOXYSILYLETHYL-SUBSTITUTED ORGANOPOLYSILOXANES

Karl-Heinz Rudolph, Cologne-Stammheim, Werner Buchner, Leichlingen, and Walter Noll, Opladen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Continuation-in-part of abandoned application Ser. No. 230,938, Mar. 1, 1972. This application Mar. 28, 1973, Ser. No. 345,816
Claims priority, application Germany, Mar. 10, 1971, P 21 11 413.6; Feb. 20, 1973, P 23 08 238.4
Int. Cl. C07f 7/08
U.S. Cl. 260—448.2 E 4 Claims

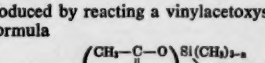
Acetoxysilylethyl-substituted organopolysiloxanes having a high content of functional substituents, corresponding to the general formula



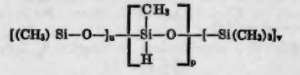
in which

$p$ is an integer from 3 to 100 inclusive;
$r$ is an integer in the range of from $p/2$ to $p$;
$u$ and $v$ have the same value, this value being zero or one;
$n$ is 2 or 3;

are produced by reacting a vinylacetoxysilane of the general formula



with a methyl-hydrogen-polysiloxane of the general formula



in the presence of a platinum catalyst, according to the invention, in a new manner which comprises intimately mixing the two reactants in a proportion of 0.98 to 1.1 mol vinylacetoxysilane per each gram atom of Si-bound hydrogen to be reacted in the methyl-hydrogen-polysiloxane, with one another and with the catalyst at room temperature; allowing the mixture to flow through a reaction zone heated to a temperature of between 180 and 200° C. at such a speed that the time of residence of the reaction mixture in the heated zone is 30 to 60 seconds; and rapidly cooling the product flowing from the reaction zone to a temperature of below 50° C.

The products are especially suitable for coatings because they react very readily with atmospheric humidity, thereby forming resinous solid products.

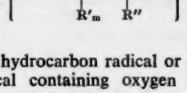
3,819,675

## CATIONIC UNSATURATED AMINE-FUNCTIONAL SILANE COUPLING AGENTS

Edwin P. Plueddemann, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

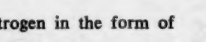
No Drawing. Application Dec. 17, 1970, Ser. No. 99,228, which is a continuation-in-part of abandoned application Ser. No. 825,035, May 15, 1969. Divided and this application Jan. 15, 1973, Ser. No. 323,595
Int. Cl. C07f 7/10, 7/18
U.S. Cl. 260—448.8 R 10 Claims

Organosilicon compounds of the formula



in which

Q is a divalent hydrocarbon radical or a divalent hydrocarbon radical containing oxygen in the form of —COC—,



groups or nitrogen in the form of

groups;

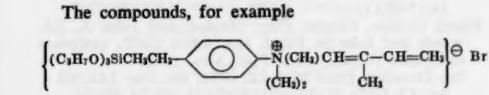
Z is a divalent organic radical having a double bond conjugated with the

moiety, Z being bonded to the nitrogen atom by a C—N bond;

R' is independently selected from the group consisting of the hydrogen atom, lower alkyl radical or a hetero-

cyclic organic compound containing the nitrogen atom as a ring member;
*m* is an integer of 1 or 2;
R'' is the hydrogen atom or a lower alkyl radical; and
Y is an acid anion; are disclosed.

The compounds, for example



as coupling agents for promoting the adhesion of organic polymers to solid inorganic surfaces.

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3,819,676

## ALKYL- OR ARYLSULFONYLOXY, ALKANOYLOXY SUBSTITUTED PROPYLPHOSPHORIC ACID LOWER ALKYL ESTERS

**Burton G. Christensen and Peter I. Pollak, Scotch Plains, and Norman L. Wendler, Summit, N.J., assignors to Merck & Co., Inc., Rahway, N.J.**

**No Drawing. Original application Apr. 25, 1969, Ser. No. 819,447, now abandoned. Divided and this application Jan. 12, 1972, Ser. No. 217,264**
**Int. Cl. C07c *143/68***
**U.S. Cl. 260—456 R** **7 Claims**

A method for the preparation of (±) and (—) (*cis*-1,2-epoxypropyl)phosphonic acid and its corresponding salts and ester derivatives which comprises treating a 1,2-disubstituted n-propylphosphonic acid or a salt or ester thereof under ring closure conditions, at least one of which substituents is hydroxy or a functionally equivalent oxygen-containing moiety and the remaining substituent being any leaving group which can be displaced to yield the desired epoxide product.

The (±) and (—) (*cis*-1,2-epoxypropyl)phosphonic acid of this invention and its salts are antibiotics which have utility as antibacterials in inhibiting the growth of gram-positive and gram-negative pathogenic bacteria.

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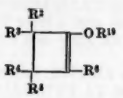
3,819,677

## 2-ALKOXY-1-SUBSTITUTED CYCLOBUTENES AND PROCESS THEREFOR

**David M. Gale, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.**

**No Drawing. Application Sept. 8, 1970, Ser. No. 70,565, which is a continuation-in-part of application Ser. No. 828,788, May 28, 1969, both now abandoned, which in turn is a continuation-in-part of application Ser. No. 599,730, Dec. 7, 1966, now Patent No. 3,459,647, dated Aug. 5, 1969. Divided and this application Apr. 14, 1972, Ser. No. 244,283**
**Int. Cl. C07c *121/02, 121/48***
**U.S. Cl. 260—464** **3 Claims**

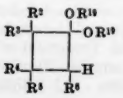
Described herein are 2-alkoxy-1-substituted cyclobutenes of the formula



wherein

$R^2$–$R^5$ are hydrogen, hydrocarbyl of up to 16 carbon atoms, chloro, or bromo;
$R^6$ is hydrogen, cyano, lower alkoxycarbonyl, carbamoyl or N-alkylcarbamoyl; and
$R^{10}$ is alkyl, aryl, aralkyl or alkaryl of up to 8 carbon atoms,

and process therefor comprising treating a compound of the formula



with an anhydrous organic or mineral acid. Polymers of the cyclobutenes are useful in molded objects, films and fibers.

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3,819,678

## CYANOALKYLAMINO-PHENYLCARBAMATES

**Erwin Nikles, Liestal, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.**

**No Drawing. Continuation-in-part of abandoned application Ser. No. 30,940, Apr. 22, 1970. This application Dec. 8, 1971, Ser. No. 206,163**
**Claims priority, application Switzerland, Apr. 26, 1969, 6,365/69**
**Int. Cl. C07c *121/78***
**U.S. Cl. 260—465 D** **10 Claims**

Aminophenylcarbamates, the amino group of which is substituted by at least one lower alkenyl radical substituted by 1 or 2 halogen atoms or by at least one lower alkyl radical substituted by a lower alkoxy, alkylmercapto or nitrile group, are effective pesticides for controlling nematodes, insects and representatives of the order Acarina. They may be used as pesticidal preparations.

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3,819,679

## MANUFACTURE OF UNSATURATED NITRILES

**Harold R. Sheely, Newton, Mass., assignor to The Badger Company, Inc., Cambridge, Mass.**

**Filed Oct. 20, 1971, Ser. No. 191,005**
**Int. Cl. C07c *121/02, 121/32***
**U.S. Cl. 260—465.3** **7 Claims**

An improved method of producing unsaturated nitriles by reaction of an olefin with ammonia and oxygen in a reactor having a fluidized catalyst bed, whereby the amount of ammonia introduced as feed and present in the reaction effluent is minimized. The olefin is reacted with the ammonia and oxygen at one level in the reactor, and hydrogen cyanide by-product which is recovered from the reaction effluent is recycled to the reactor at a level in the fluidized bed above the level at which the ammonia and olefin are reacted.

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3,819,680

## NITRATION OF BENZOIC ACID ESTERS

**Kinzo T. Yamashita, Essex, and David E. Graham and Eldred Welch, Union, N.J., assignors to GAF Corporation, New York, N.Y.**

**No Drawing. Filed May 28, 1970, Ser. No. 41,534**
**Int. Cl. C07c *101/54, 101/58***
**U.S. Cl. 260—471 R** **10 Claims**

Mononitro derivatives of benzoic acid, and mono- and dichloro-benzoic acid, are produced economically and in good yield by nitration of benzoic acid or chloro- or dichloro-benzoic acid esters, preferably a lower alkyl ester, with a mixture of nitric acid and sulfuric acid, or oleum containing up to the theoretical of sulfur trioxide required to combine with the water formed in nitration, at a temperature of about 10° C. to about 80° C. The thus produced mononitro esters may be hydrolyzed to the corresponding mononitro-acid.

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3,819,681

## ANTI-INFLAMMATORY 4-ARYL-4-HYDROXYALLOPHANATES

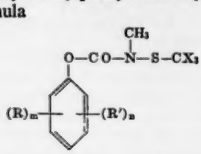
**Thomas R. Sharpe, 1015 Faun Road, Graylyn Crest, Wilmington, Del. 19803**

**No Drawing. Filed Feb. 22, 1973, Ser. No. 334,577**
**Int. Cl. C07c *127/18***
**U.S. Cl. 260—471 C** **6 Claims**

Certain 4-(substituted phenyl)-4-hydroxyallophanates are useful anti-inflammatory agents, which do not cause undesirable side effects. Representative 4-(substituted phenyl)-4-hydroxyallophanates within the scope of this invention include methyl 4-(4-chlorophenyl)-4-hydroxyallophanate and ethyl 4-(4-bromophenyl)-4-hydroxyallophanate.

3,819,682
SULFENYLATED CYCLOALKYLPHENYL-N-METHYLCARBAMATES
Gerhard Zumach, Cologne, Engelbert Kuhle, Bergisch-Gladbach, and Wolfgang Behrenz and Ingeborg Hammann, Cologne, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany
No Drawing. Filed Jan. 12, 1972, Ser. No. 217,281
Claims priority, application Germany, Jan. 23, 1971, P 21 03 199.2
Int. Cl. C07c 145/00
U.S. Cl. 260—479 C 7 Claims

Sulfenylated cycloalkylphenyl-N-methylcarbamates of the general formula



(I)

in which

R is cycloalkyl with 5 to 7 ring carbon atoms optionally substituted with 1 or 2 alkyl groups,
R′ is lower alkyl or alkoxy, halogen or nitro,
X is fluorine, chlorine or bromine,
*m* is 1, 2 or 3, and
*n* is 0, 1 or 2,

which possess insecticidal, acaricidal and fungicidal properties.

3,819,683
N-ACYL CARBAMATE PRODUCTION
Hans Dieter Krebs, Heathmont, Victoria, and Mervyn Vero Leeding, Forest Hill, Victoria, Australia, assignors to ICI Australia Limited, Melbourne, Victoria, Australia
No Drawing. Filed May 4, 1972, Ser. No. 250,118
Claims priority, application Australia, May 24, 1971, 4,973/71; June 3, 1971, 5,089/71
Int. Cl. C07c 125/06
U.S. Cl. 260—479 C 11 Claims

Process for the preparation of N-acyl and N-aroyl carbamates by acylation with an acid halide.

3,819,684
SULFENYLATED N-METHYLCARBAMIC ACID ARYL ESTERS
Engelbert Kuhle, Bergisch-Gladbach, Erich Klauke, Odenthal-Hahnenberg, Ingeborg Hammann, Cologne, Brigitte Hamburger, Cologne-Duennwald, and Paul-Ernst Frohberger, Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany
No Drawing. Filed Apr. 30, 1970, Ser. No. 33,505
Claims priority, application Germany, May 6, 1969, P 19 22 929.9
Int. Cl. C07c 161/00
U.S. Cl. 260—479 C 13 Claims

Sulfenylated N-methylcarbamic acid aryl esters, i.e. phenyl or substituted-phenyl esters of N-(methylthio)-N-methylcarbamic acid in which the methylthio group is substituted by three chlorine atoms or by two chlorine atoms and a fluorine atom, which possess insecticidal, acaricidal, fungicidal and microbicidal properties and which may be produced by conventional methods.

3,819,685
PREPARATION OF ESTERS FROM UNSATURATED ALDEHYDES AND ALCOHOLS
Robert K. Grasselli, Chagrin Falls, and Dev D. Suresh, Cleveland, Ohio, assignors to The Standard Oil Company, Cleveland, Ohio
No Drawing. Filed Dec. 6, 1971, Ser. No. 205,321
Int. Cl. C07c 69/54
U.S. Cl. 260—486 R 11 Claims

Acrylic esters and methacrylic esters are formed directly from the aldehyde by reacting acrolein or methacrolein with molecular oxygen and an alcohol in the presence of an oxidation catalyst under the conditions normally associated with the reaction of the aldehyde to the acid.

3,819,686
16,17-SECO-$\Delta^{4,9(10)}$ AND -$\Delta^{4,9(10),11}$ STEROIDS
Pierre Crabbe, Mexico City, Mexico, and John A. Edwards and John H. Fried, Los Altos, Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.
No Drawing. Filed May 12, 1971, Ser. No. 142,762
Int. Cl. C07c 49/56, 69/14, 69/24, 69/74, 69/78
U.S. Cl. 260—488 B 20 Claims

The novel 16,17-secoestra-4,9(10)-diene, 16,17-secoestra-4,9(10),11-triene, 16,17-secogona-4,9(10)-diene and 16,17-secogona-4,9(10)-triene compounds and the 14$\beta$-isomers thereof useful as antiandrogenic agents, and methods for their preparation.

3,819,687
3-OXYGENATED 5,19-CYCLO-A-NOR-5α,10α,17α-PREGN-20-YN-17-OLS AND ESTERS
George R. Lenz, Glenview, Ill., assignor to G. D. Searle & Co., Chicago, Ill.
No Drawing. Filed Aug. 24, 1973, Ser. No. 391,316
Int. Cl. C07c 171/06
U.S. Cl. 260—488 B 10 Claims

Preparation of estrogenic and fertility-inhibiting 3-oxygenated 5,19 - cyclo-A-nor-5α,10α,17α-pregn-20-yn-17-ols and esters is disclosed.

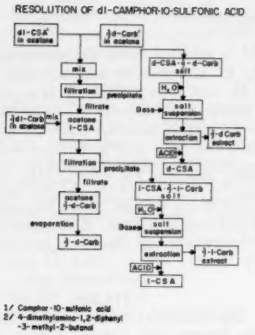
3,819,688
PROCESS FOR THE PREPARATION OF PEROXY ACIDS
Leonard S. Silbert and Dolores A. Konen, Philadelphia, Pa., assignors to the United States of America as represented by the Secretary of Agriculture
No Drawing. Filed Nov. 10, 1970, Ser. No. 88,490
Int. Cl. C07c 73/10
U.S. Cl. 260—502 R 11 Claims

Peroxy acids are prepared by perhydrolysis with highly concentrated hydrogen peroxide of a mixed anhydride of an appropriate carboxylic acid such as a diethyl phosphoric-carboxylic acid anhydride. Although perhydrolysis is usually effected by catalysis with methanesulfonic acid, catalysis was not required in at least one case. Both aliphatic and aromatic peroxy acids containing either electron-donating or electron-accepting groups can be prepared indicating that the process of the invention is general in scope and is utilizable with compounds having a broad range of carbon chain lengths. Yields of peroxy acids above 70% are easily obtained.

3,819,689
RESOLUTION OF dl-CAMPHOR-10-SULFONIC ACID
Wayne E. Thompson and Albert Pohland, Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.
Filed June 23, 1971, Ser. No. 155,981
Int. Cl. C07c 143/00
U.S. Cl. 260—503 2 Claims

dl-Camphor-10-sulfonic acid is resolved in acetone via addition of 0.5 equivalents of resolving amine, α-d-4-dimethylamino-1,2-diphenyl-3-methyl-2-butanol. Crystalline α-d-4-dimethylamino-1,2-diphenyl - 3 - methyl-2-butanol d-camphor-10-sulfonate precipitates from the resolution mixture, is separated therefrom to afford d-camphor-10-sulfonic acid and the resolving amine on treatment with base. Addition of two equivalents of α-dl-4-dimethylamino-1,2-diphenyl-3-methyl-2-butanol to the remaining resolution mixture provides α-l-4-dimethylamino - 1,2 - diphenyl-3-methyl-2-butanol l-camphor-10-sulfonate as a crystalline precipitate. Treatment of the latter precipitate with base affords l-camphor-10-sulfonic acid and recoverable l-4-dimethylamino - 1,2 - diphenyl-3-methyl-2-buta-

nol. d- and l-Camphor-10-sulfonic acids can each be employed in the resolution of α-dl-4-dimethylamino-1,2-di-




1/ Camphor-10-sulfonic acid
2/ 4-dimethylamino-1,2-diphenyl-3-methyl-2-butanol

phenyl-3-methyl-2-butanol in the preparation of d-propoxyphene and levopropoxyphene.

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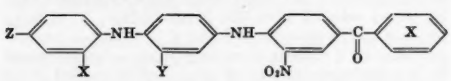
**3,819,690**

## ACID NITRO DYESTUFFS, THEIR MANUFACTURE AND USE

**Jean Bruenisholz, Reinach, and Fabio Beffa, Riehen, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland**

**No Drawing. Filed Apr. 3, 1972, Ser. No. 240,850**
**Claims priority, application Switzerland, Apr. 19, 1971, 5,634/71; Feb. 23, 1972, 2,619/72**
**Int. Cl. C07c** *143/56*
**U.S. Cl. 260—510** **2 Claims**

Acid nitro dyestuffs of the formula



wherein the phenyl radical X is preferably substituted, in particular by chlorine and by alkyl or alkoxy groups containing from 1 to 4 carbon atoms in which one Y is an $SO_3H$ group and the other Y is hydrogen, and Z represents either hydrogen or an $NO_2$ group.

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**3,819,691**

## LINEAR ALKYL GEMINAL DISULFONATES AS PHOSPHATE-FREE ACTIVES

**Victor P. Kurkov, San Rafael, and Samuel H. Sharman, Contra Costa, Calif., assignors to Chevron Research Company, San Francisco, Calif.**

**No Drawing. Filed June 3, 1971, Ser. No. 150,856**
**Int. Cl. C07c** *143/04, 143/10*
**U.S. Cl. 260—513 R** **4 Claims**

Heavy duty detergent active materials comprise organic geminal disulfonates of the formula

in which R is a substantially linear alkyl group of 14 to 29 carbon atoms, X is H or a water-soluble, salt-forming cation, and Y is H,

or —$CH_2$—OH.

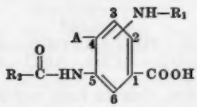
**3,819,692**

## BENZOIC ACID DERIVATIVES

**Peter Werner Feit, Gentofte, and Ole Bent T. Nielsen, Vanlose, Denmark, assignors to Lovens Kemiske Fabrik Produktionsaktieselskab, Ballerup, Denmark**

**No Drawing. Filed June 1, 1971, Ser. No. 149,012**
**Claims priority, application Great Britain, June 18, 1970, 29,740/70**
**Int. Cl. C07c** *101/48*
**U.S. Cl. 260—519** **7 Claims**

The invention relates to a series of new compounds, to salts of these compounds and to methods for the preparation of the compounds. The new compounds have the general formula:



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in which $R_1$ is selected from the group consisting of alkyl radicals with from 3 to 8 carbon atoms in the carbon chain; mono-nuclear aromatically and mono-nuclear heterocyclically substituted methyl and ethyl; A is selected from the group consisting of unsubstituted and substituted phenoxy radicals, phenylthio radicals, benzoyl, benzyl and α-hydroxybenzyl radicals; $R_2$ is selected from the group consisting of hydrogen, lower alkyl groups, lower alkoxy groups, unsubstituted and mono- and di-substituted amino groups.

In particular the compounds of formula (I) have a pronounced diuretic and/or saluretic activity which is surprising in view of the chemical structure and the absence of a sulphamyl group.

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**3,819,693**

## 9-HYDROXYFLUORENE-2-ALKANOIC ACIDS AND ESTERS THEREOF

**Seymour D. Levine, North Brunswick, and Pacifico A. Principe, South River, N.J., assignors to E. R. Squibb & Sons, Inc., New York, N.Y.**

**No Drawing. Filed June 18, 1971, Ser. No. 154,600**
**Int. Cl. C07c** *69/76*
**U.S. Cl. 260—520** **3 Claims**

9-Oxygenated fluorene-2-acetic acid derivatives and corresponding 9-halogenated derivatives and methods for preparing these derivatives are provided. These compounds are useful as anti-inflammatory agents. In addition, a method for treating inflammatory conditions by administering these 9-substituted fluorene-2-acetic acid derivatives are provided.

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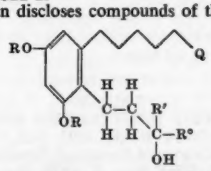
**3,819,694**

## 6-[2-(3-HYDROXYALKYL) - 3,5 - DISUBSTITUTED-PHENYL]HEXANOIC ACIDS AND SALTS THEREOF

**Eugene E. Galantay, Morristown, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.**

**No Drawing. Filed Nov. 22, 1971, Ser. No. 201,161**
**Int. Cl. C07c** *65/20, 65/02*
**U.S. Cl. 260—521 R** **7 Claims**

The invention discloses compounds of the formula:



in which Q is —$CH_2$OH or —COOR''; R° is straight chain lower alkyl ($C_4$–$C_6$; R' is hydrogen or alkyl; and R'' is hydrogen or a cation forming pharmaceutically acceptable salt, e.g., 6 - [2 - (3 - hy-

droxyoctyl) - 3,5 - dimethoxyphenyl]hexanoic acid and its sodium salt, said compounds being useful as pharmaceutical agents, e.g., as bronchodilators. The above final products where R' is hydrogen may be prepared by catalytic hydrogenation of a corresponding 1-[2',4' - disubstituted-6'-ω-substituted-hexyl - 1' - phenyl]-1-olefin-3-one, by reduction of novel intermediates which are 6-[3,5 - disubstituted - 2 - (2-alkanoylethyl)phenyl]hexanoic acid and hexanols which may be obtained from the above-mentioned catalytic hydrogenation and, where R' is alkyl, by reaction of the last named hexanoic acid and hexanols with a Grignard reagent, said novel intermediates being similarly useful as pharmaceutical agents.

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**3,819,695**

**PROCESS FOR PREPARATION OF METHYLTEREPHTHALIC ACID AND 4-METHYLISOPHTHALIC ACID**

**Gentaro Yamashita, Takeshi Fujii, and Koichiro Sakota, Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan**

**No Drawing. Filed Apr. 28, 1971, Ser. No. 138,307**
**Int. Cl. C07c *63/02, 63/26***
**U.S. Cl. 260—524 R** **12 Claims**

Methylterephthalic acid and 4-methylisophthalic acid are prepared by oxidizing pseudocumene with molecular oxygen in 3–25 parts by weight, per part of pseudocumene, of acetic acid at 100–220° C. with the partial pressure of oxygen maintained at not less than 0.2 atmosphere, in the presence of a catalyst consisting of a cobalt compound and a bromine compound both soluble in the acetic acid under the reaction conditions. The amounts of the catalyst components must meet the requirements shown by equations (Ia) and (IIa) which represent the relation among the reaction temperature (T), the ratio (A) of the weight of cobalt metal to that of pseudocumene and acetic acid combined, and the ratio (B) of gram-atoms of bromine to those of cobalt metal. A part of the cobalt compound may be replaced by a manganese compound.

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**3,819,696**

**PROCESS FOR THE PRODUCTION OF TRIALKALI CITRATES**

**Georg Kominek, Pernhofen, Wulzeshofen, Austria, assignor to Aktiengesellschaft Jungbunzlauer Spiritus- und Chemische Fabrik, Wien, Austria**

**No Drawing. Filed Feb. 2, 1973, Ser. No. 329,240**
**Claims priority, application Austria, Feb. 4, 1972, A906/72**
**Int. Cl. C07c *59/16***
**U.S. Cl. 260—535 P** **16 Claims**

Object of the invention is a process for the production of trialkali citrates starting from metal citrates of low solubility. In order to obtain highly concentrated solutions of trialkali citrates the process comprises the steps of adding in order to adjust an alkaline medium an alkali hydroxide to a suspension in water of a metal citrate of low solubility selected from the group consisting of alkaline earth metal citrates and alkaline earth metal-alkali citrates, said suspension having a concentration of 400 to 500 g./l. and then under intensive agitating at a temperature ranging from 40 to 80° C. adding alkali carbonate in solid form to said suspension.

The alkali carbonates employed can be sodium carbonate or potassium carbonate.

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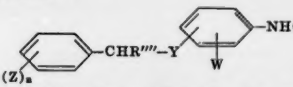
**3,819,697**

**SUBSTITUTED PHENYLUREA HERBICIDES**

**Barrington Cross, Rocky Hill, N.J., assignor to American Cyanamid Company, Stamford, Conn.**

**No Drawing. Filed Mar. 4, 1970, Ser. No. 16,580**
**Int. Cl. C07c *127/18***
**U.S. Cl. 260—553 A** **5 Claims**

The invention is directed to herbicidally active compounds and compositions and to herbicidal processes having as an active ingredient a compound represented by the formula:



wherein R' is selected from the group consisting of H, $CH_3$, $C_2H_5$; R'' is a member selected from the group consisting of H, and lower alkyl; W is a member selected from the group consisting of H, halo, lower alkyl, and $NO_2$; Y is a member selected from the group consisting of S, O, SO, and $SO_2$; Z is a member selected from the group consisting of $NO_2$, $NH_2$, $N(R''')_2$, halo, lower alkyl, $X_m—R'''—$, $R'''O—$, $R'''S(O)_n—$, $R'''NH—$, —OH, —COOH, —$COOR'''$, —CN, $—NHCON(R''')_2$ and $R'''CONH—$; X is halo; R''' is lower alkyl; R'''' is hydrogen, lower alkyl or phenyl; $n$ is 0, 1 to 2; and $m$ is 1, 2 or 3.

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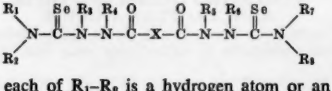
**3,819,698**

**BIS-SELENOSEMICARBAZIDES**

**John Colin Brown and Patrick Joseph Keogh, Ilford, England, assignors to Ilford Limited, Ilford, England**

**No Drawing. Filed Dec. 17, 1971, Ser. No. 209,340**
**Claims priority, application Great Britain, Dec. 22, 1970, 60,802/70**
**Int. Cl. C07c *103/30***
**U.S. Cl. 260—558 H** **4 Claims**

New bis-selenosemicarbazides of the formula



wherein each of $R_1$–$R_8$ is a hydrogen atom or an alkyl, aralkyl or aryl group there being up to four substituent groups in the molecule of which all four may be alkyl groups but only two of which may be aryl or aralkyl groups, at least one of $R_1$, $R_2$, $R_3$, $R_6$, $R_7$ and $R_8$ being a hydrogen atom and X is a direct link or a divalent linking group selected from the group $-(CH_2)_n-Y-(CH_2)_m-$ where $n$ and $m$ are each 0–5 and Y is $-(CH_2)-$, an oxygen atom or a sulphur atom or a group $—NR_9—$ where $R_9$ is a hydrogen atom or an alkyl, aryl or aralkyl group or from a phenylene or naphthalene nucleus are described.

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**3,819,699**

**PURIFICATION OF LYSINE AMIDE OR CARBOXYLATE SALTS THEREOF**

**Fred W. Koff, Clifton, and John Pisanchyn, Morristown, N.J., assignors to Allied Chemical Corporation, New York, N.Y.**

**No Drawing. Filed Dec. 29, 1971, Ser. No. 215,961**
**Int. Cl. C07c *103/00***
**U.S. Cl. 260—561 A** **6 Claims**

Methods for the purification of D,L,-lysine amide or carboxylate salts thereof, by forming an adduct with $CO_2$, HCl or HBr, which separates out as a solid.

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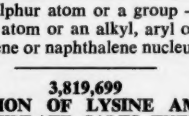
**3,819,700**

**2-(HYDROCARBYLTHIO) - 2 - (HYDROXYIMINO)-ACETAMIDE S-OXIDES AND DERIVATIVES**

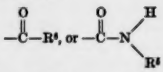
**Russell F. Bellina, 763 Montclair Drive, Apt. 10, Claymont, Del. 19703**

**No Drawing. Continuation-in-part of abandoned application Ser. No. 31,391, Apr. 23, 1970. This application Mar. 5, 1971, Ser. No. 121,573**
**Int. Cl. C07c *103/12, 103/14, 103/22, 103/24***
**U.S. Cl. 260—561 S** **12 Claims**

2-(Hydrocarbylthio) - 2 - (hydroxyimino)-acetamido S-oxides and derivatives of the general formula:



where $n$ is 1 or 2, $R^4$ is H,



and $R^1$, $R^2$, $R^3$, $R^5$, and $R^6$ are as hereinafter defined, are useful as fungicides. The compounds are prepared by oxidation of the corresponding sulfides.

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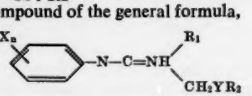
## 3,819,701
## FORMAMIDINE DERIVATIVES AND THE COMPOSITION CONTAINING SAME

**Saburo Takahashi, Kamakura, Hiroshi Oyama and Hiroshi Naka, Atsugi, Takaji Yamamoto, Fujisawa, Kentaro Nakatomi, Kamakura, Kouichi Ishibe, Atsugi and Toshihiro Saito, Kajioka, Japan, assignors to Hokko Chemical Industry Co., Ltd., Tokyo, Japan**

**No Drawing. Filed Mar. 17, 1971, Ser. No. 125,369**
**Claims priority, application Japan, Mar. 18, 1970, 45/22,254; Dec. 11, 1970, 45/109,721, 45/109,722**
**Int. Cl. C07c** *123/00*
**U.S. Cl. 260—564 RF** **2 Claims**

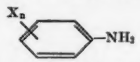
A novel compound of the general formula,



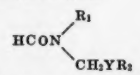
(I)

wherein X is a halogen atom, or an alkyl, haloalkyl, alkoxy, nitro or alkylcarbamoyloxy group; $n$ is zero or an integer of 1 to 3; $R_1$ is a hydrogen atom, or an alkyl, alkenyl, alkynyl, haloalkyl, alkylthioalkyl, alkoxyalkyl, haloalkoxyalkyl or haloalkylthioalkyl group; $R_2$ is an alkyl, alkenyl, alknyl, alkylthioalkyl, alkoxyalkyl or haloalkyl group; and Y is an oxygen or sulfur atom, is useful in agriculture and horticulture as an insecticidal and miticidal chemical capable of effectively killing rice borers which are most injurious to rice and spider mites which are injurious to fruits and vegetables, without giving any phytotoxicity to various cultivated crops such as, for example, radish, melon, kidney bean, tomato, strawberry, mandarin, pear, apple, grape, chrysanthemum and tobacco.

The compound of the general formula (I) is prepared by reacting a compound of the formula,



wherein X and $n$ are as defined above, or a salt thereof, with a compound of the formula



wherein $R_1$, $R_2$ and Y are as defined above, and with a halogenating agent.

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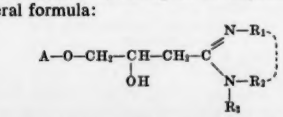
## 3,819,702
## BUTYRAMIDINE

**Victor Lafon, Paris, France, assignor to Societe anonyme dite: Orsymonde, Paris, France**

**No Drawing. Filed June 18, 1971, Ser. No. 154,679**
**Claims priority, application France, June 29, 1970, 7024016**
**Int. Cl. C07c** *123/00*
**U.S. Cl. 260—564 G** **5 Claims**

New derivatives and analogues of butyramidine having the general formula:



I

in which A represents α-naphthyl or β-naphthyl, $R_3$ represents a hydrogen atom or a lower alkyl group having 1 to 3 carbon atoms, $R_2$ represents a hydrogen atom, a hydroxyl group or a lower alkyl group having 1 to 3 carbon atoms, and $R_1$ represents a hydrogen atom, $R_1$ and $R_2$ considered together being capable of forming with the two nitrogen atoms and the carbon atom of the amidine function of 2-imidazolinyl or 1,4,5,6-tetrahydro-2-pyrimidinyl radical when $R_3$ is a hydrogen atom.

The compounds of Formula I and the non-toxic acid addition salts thereof are active β-blocking agents and are used in the treatment of cardiac troubles.

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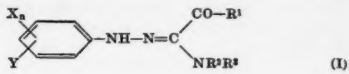
## 3,819,703
## α-AMINO-α-ACYL-CARBONYL-PHENYL-HYDRAZONES

**Wilfried Draber and Karl-Heinz Buchel, Wuppertal-Elberfeld, Ingeborg Hammann, Cologne, and Paul-Ernst Frohberger, Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany**

**No Drawing. Filed Mar. 20, 1972, Ser. No. 236,450**
**Claims priority, application Germany, Mar. 23, 1971, P 21 13 997.9**
**Int. Cl. C07c** *123/00*
**U.S. Cl. 260—564 R** **6 Claims**

α-amino-α-acyl-carbonyl-phenylhydrazones of the general formula



(I)

in which

X and Y each independently is hydrogen, alkyl, cycloalkyl, halogen, nitro or haloalkyl,
$n$ is 1, 2 or 3,
$R^1$ and $R^2$ each independently is lower alkyl, and
$R^3$ is hydrogen or lower alkyl, or
$R^2$ and $R^3$ together with the nitrogen atom to which they are attached form a heterocyclic ring,

which possess insecticidal, acaricidal and fungicidal properties.

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## 3,819,704
## CONVERSION OF SATURATED CARBOXYLIC ACIDS TO N-ALKYLATED ALDIMINES

**James D. Adkins, 9800 E. Bluegrass Parkway, Jeffersontown, Ky. 40299; Angela O. Bedenbaugh and John H. Bedenbaugh, both of Box 466, Southern Station, Hattiesburg, Miss. 39401; and W. A. Bergin, 1812 Orso Drive, Laurel, Miss. 39440**

**No Drawing. Filed Feb. 5, 1971, Ser. No. 113,076**
**Int. Cl. C07c** *119/00*
**U.S. Cl. 260—566 R** **3 Claims**

This invention relates to a process whereby saturated aliphatic carboxylic acids or their preformed metal salts are converted to their corresponding N-methylaldimine or N-ethylaldimine analogs. More specifically, this process involves treating the carboxylic acid or its preformed metal salt in methylamine or ethylamine with lithium metal to form its analogous N-methylaldimine or N-ethylaldimine.

The existing methods for the preparation of N-alkylated aldimines from carboxylic acids involves the initial conversion of the carboxylic acid to its aldehyde analog (which usually involves several discrete steps) followed by reaction of the aldehyde with a primary amine to produce the N-alkylated aldimine. It is the object of the present invention to provide a process whereby this conversion of a carboxylic acid to the N-methylaldimine or N-ethylaldimine may be effected in a single direct step.

It has been found that the object of the invention may be accomplished by reaction of a solution of the acid or its metal salt in methylamine or ethylamine with lithium metal and maintaining non-acidic conditions during the product isolation procedure.

3,819,705

## QUATERNARY SALTS OF TRI-(β-PROPYLOXYETHYL) AMINE DERIVATIVES AND PROCESS FOR PRODUCING SAME

Yuichi Inai and Kanzo Okabaki, Tokyo, Mikio Uchiyama and Katsutoshi Shimada, Saitama, and Kengo Kagei and Motoaki Bessho, Tokyo, Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

No Drawing. Filed Nov. 8, 1971, Ser. No. 196,730
Claims priority, application Japan, Nov. 11, 1970, 45/98,765
Int. Cl. C07c *87/30, 93/04;* A01n *9/20*
U.S. Cl. 260—567.6 M 1 Claim

Novel quaternary salts of tri-(β-propyloxyethyl) amine derivatives of the formula:

$$R—N^+—(CH_2CH_2OCH_2CH_2CH_3)_3X^- \quad (I)$$

wherein R is a member selected from the group consisting of alkyl groups; aralkyl groups except benzyl group; cyclohexylalkyl groups; benzyl groups substituted by hydroxyl, alkoxy, phenoxy or benzyloxy group; benzyl groups substituted by at least two lower alkyl groups; cinnamyl group; a phenacyl group; phenoxyalkyl groups; and naphthylmethyl group; and X stands for a halogen atom

and a process for the preparation of quaternary salts of tri-(β-propyloxyethyl) amine derivatives of the above formula (I) by reacting tri(β-propyloxyethyl) amine of the formula

$$N—(CH_2CH_2OCH_2CH_2CH_3)_3 \quad (II)$$

with a compound of the formula

$$RX \quad (III)$$

wherein R and X are as defined above the compounds possess anti-ulcer properties.

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3,819,706

## META CHLORO SUBSTITUTED-α-BUTYLAMINOPROPIOPHENONES

Nariman B. Mehta, Raleigh, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

No Drawing. Filed Nov. 30, 1970, Ser. No. 93,852
Claims priority, application Great Britain, Dec. 4, 1969, 59,231/69
Int. Cl. C07c *97/10*
U.S. Cl. 260—570.5 C 6 Claims

The compounds *m*-chloro-α-t-butylaminopropiophenone and *m*-fluoro - α - t - butylaminopropionphenone or salts thereof. The compounds are useful in the treatment of mammals suffering from a depressed state.

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3,819,707

## 4-(AMINOALKYLAMINO)-2-HALOBENZYL ALCOHOLS

Sydney Archer, Bethlehem, and David Rosi, East Greenbush, N.Y., assignors to Sterling Drug Inc., New York, N.Y.

No Drawing. Continuation-in-part of Ser. No. 42,876, June 2, 1970, which is a continuation-in-part of Ser. No. 664,628, Aug. 31, 1967, now Patent No. 3,558,629, Jan. 26, 1971, which is a continuation-in-part of Ser. No. 444,848, Apr. 1, 1965, now Patent No. 3,379,620, Apr. 23, 1968. This application Jan. 26, 1972, Ser. No. 221,047
Int. Cl. C07c *87/48*
U.S. Cl. 260—570.5 P 5 Claims

4-[Amino-(polycarbon - lower-alkyl)-amino]-2-halobenzyl alcohols and lower-alkyl ethers thereof have schistosomacidal activity. The benzyl alcohols are prepared: by reduction of the corresponding benzaldehydes or lower-alkyl benzoates; by microbiological oxidation of the corresponding 4-substituted-amino-2-halotoluenes; or, for the compounds where polycarbon-lower-alkyl is ethylene, by reducing the corresponding lower-alkyl 4-(aminoacetylamino)-2-halobenzoates or by reducing the corresponding 4-(aminoacetylamino) - 2 - halobenzyl alcohols. The ethers are prepared by heating the benzyl alcohols with a lower-alkanol in the presence of an acid.

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3,819,708

## N,N'-DISUBSTITUTED-p-PHENYLENEDIAMINES

Robert E. Manning, Mountain Lakes, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.

No Drawing. Continuation-in-part of applications Ser. No. 118,517 and Ser. No. 118,518, both Feb. 24, 1971, both now abandoned. This application Dec. 22, 1971, Ser. No. 211,109
Int. Cl. C07c *93/14*
U.S. Cl. 260—573 12 Claims

N,N'-disubstituted - p - phenylenediamines, e.g., N-(3-isopropoxypropyl)-N'-(2 - octyl)-p-phenylenediamine or N-phenethyl-N'-(2 - octyl)-p-phenylenediamine, are prepared by condensing phenylenediamines with an alkyl carbonyl in the presence of a reducing catalyst, and are useful as hypolipidemic and anti-obesity agents.

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3,819,709

## SYNTHESIS OF N-METHYLANILINE

Koichi Murai, Kyoto-fu, Giichi Akazome, Kyoto, Tatsuo Kyuma, Uji, and Mikia Nakazawa, Kyoto, Japan, assignors to New Japan Chemical Company Limited, Fushimi-ku, Kyoto-shi, Japan

No Drawing. Filed Dec. 9, 1970, Ser. No. 96,638
Int. Cl. C07c *87/62*
U.S. Cl. 260—577 5 Claims

A method of manufacturing N-methylaniline by reacting aniline with methanol. The reaction is conducted in the presence of a catalyst selected from the group consisting of (a) copper and (b) a chromium catalyst having the formula

$$Cr \cdot Me^1 \cdot Me^2 \cdot O$$

wherein $Me^1$ is Cu, Zn, Fe, or Ni and $Me^2$ is Ba, Ca, Mg or Mn, Cr being contained in the range of 20 to 80 weight percent, $Me^1$ being contained in the range of 20 to 80 weight percent and $Me^2$ being contained in the range of 0 to 5 weight percent, based on the total weight of said metals respectively.

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3,819,710

## PROCESS FOR IMPROVING COLOR AND COLOR STABILITY OF ETHANOLAMINES

Thomas E. Jordan, Louisville, Ky., assignor to Olin Corporation

No Drawing. Filed Jan. 4, 1973, Ser. No. 320,918
Int. Cl. C07c *89/04, 91/04*
U.S. Cl. 260—584 R 10 Claims

Process for improving the color and color stability of ethanolamines by hydrogenation of crude mono-, di- and tri-ethanolamine using selected catalysts at selected temperatures and pressures.

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3,819,711

## NOVEL NORERMOPHILANE DERIVATIVES

Giuliano Bozzato, Kusnacht, Mario Pesaro, Zurich, Peter Schudel, Grut, near Wetzikon, and Marianne Hug-Inderbitzin, Schwerzenbach, Switzerland, and Robert Edward Erickson, Westfield, N.J., assignors to Givaudan Corporation, Clifton, N.J.

No Drawing. Filed Feb. 1, 1971, Ser. No. 111,736
Claims priority, application Switzerland, Feb. 19, 1970, 2,394/70
Int. Cl. C07c *45/00, 49/36*
U.S. Cl. 260—586 R 4 Claims

There are provided certain 2-oxygenated-6-isopropyl-Decalins, methyl substituted and unsaturated derivatives thereof which possess interesting and useful properties as odorants and flavorants.

3,819,712

## MERCAPTO- OR ALKYLTHIO-SUBSTITUTED TERPENOIDS

**Dietmar Lamparsky, Wangen-Dubendorf, and Peter Schudel, Grut, near Wetzikon, Switzerland, assignors to Givaudan Corporation, Clifton, N.J.**

**No Drawing. Filed Sept. 3, 1970, Ser. No. 69,457**

**Claims priority, application Switzerland, Sept. 10, 1969, 13,748/69**

**Int. Cl. C07c *49/44***

**U.S. Cl. 260—593 R** **1 Claim**

There are provided novel mercapto- or alkylthio-substituted oxo-terpenoids having 10 carbon atoms in the terpenoid skeleton. These novel compounds may be acyclic monocyclic or bicyclic. The novel compounds are useful as odorants particularly, but also for producing aromas, e.g. of a vegetable note.

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3,819,713

## PRODUCTION OF ALKENONES

**Horst Pommer, Ludwigshafen, Herbert Mueller, Frankenthal, and Hermann Overwien, Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany**

**No Drawing. Continuation-in-part of abandoned application Ser. No. 660,195, Aug. 14, 1967. This application Apr. 13, 1970, Ser. No. 28,080**

**Int. Cl. C07c *49/20***

**U.S. Cl. 260—593 R** **5 Claims**

Alkenones whose olefinic double bond is in the $\delta,\epsilon$-position or $\gamma,\delta$-position to the keto group, are prepared by reaction of an olefin with a $\beta$-hydroxyketone in the liquid phase or in a single reaction stage by reaction of an olefin with formaldehyde or a compound yielding formaldehyde and an aliphatic ketone in the liquid phase. Alkenones are intermediates for the production of perfumes and vitamins.

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3,819,714

## PROCESS FOR PREPARING 2,5-HEXANEDIONE

**Henry Bluestone, University Heights, and Edmond R. Osgood, Mentor, Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio**

**No Drawing. Filed Sept. 15, 1972, Ser. No. 289,489**

**Int. Cl. C07c *45/18***

**U.S. Cl. 260—595** **6 Claims**

2,5-Hexanedione is prepared by hydrolysis of the lactone of alpha-acetyl-gamma-cyano-gamma-hydroxyvaleric acid in the presence of alkali and with the inclusion of ferrous sulfate which complexes the hydrocyanic acid by-product formed during the hydrolysis, thus preventing its further reaction with and degradation of the diketone product.

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3,819,715

## PRODUCTION OF METHACROLEIN

**Wilhelm Vogt, Hurth-Efferen, and Hermann Glaser, Erfstadt Lechenich, Germany, assignors to Knapsack Aktiengesellschaft, Knapsack, near Cologne, Germany**

**No Drawing. Filed Nov. 8, 1971, Ser. No. 196,806**

**Claims priority, application Germany, Nov. 9, 1970, P 20 54 988.6**

**Int. Cl. C07c *47/20***

**U.S. Cl. 260—601 R** **5 Claims**

Methacrolein is produced by heating a diacetoxyisobutene together with water in the presence of an acid and distilling off resulting methacrolein. The methacrolein is formed by hydrolysis coupled with separation of acetic acid.

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3,819,716

## SULFONYL OR SULFINYL SUBSTITUTED INDENYL ALCOHOLS

**Tsung-ying Shen, Westfield, and Howard Jones, Holmdel, N.J., assignors to Merck & Co., Inc., Rahway, N.J.**

**No Drawing. Filed Dec. 6, 1972, Ser. No. 312,456**

**Int. Cl. C07c *147/06***

**U.S. Cl. 260—607 A** **6 Claims**

New substituted indenyl alcohols and derivatives thereof which have anti-inflammatory, anti-pyretic and analgesic activity. Also included are methods of preparing said indenyl compounds, pharmaceutical compositions having said indenyl compounds as an active ingredient and methods of treating inflammation.

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3,819,717

## ASYMMETRICAL TRI- AND TETRASULFIDES

**Christoph von Szczepanski, Joseph Heindl, Eberhard Schroder, Hans-Joachim Kessler, and Ulrich Redmann, Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Germany**

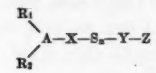
**No Drawing. Filed Mar. 23, 1972, Ser. No. 237,508**

**Claims priority, application Germany, Mar. 23, 1971, P 21 14 653.2**

**Int. Cl. C07c *149/12***

**U.S. Cl. 260—608** **13 Claims**

Useful as fungicidal and/or bactericidal agents are asymmetrical tri- and tetrasulfides of the formula



wherein

$R_1$ and $R_2$ each are hydrogen, halogen, alkyl of 1–4 carbon atoms, alkoxy of 1–4 carbon atoms, or nitro;

A represents aryl or an aromatic heterocyclic group;

X is a covalent bond between A and S, or represents alkylene of 1–4 carbon atoms;

$n$ is 3 or 4;

Y is alkylene of 1–4 carbon atoms; and

Z is hydroxy, halogen, alkoxy of 1–5 carbon atoms, or alkanoyloxy of 1–5 carbon atoms.

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3,819,718

## PROCESS FOR THE CONTINUOUS PREPARATION OF THIOETHER

**Osamu Okumura, Funabashi, Takenobu Sakatani, Chiba, and Masuzo Nagayama, Tokyo, Japan, assignors to Lion Fat and Oil Company, Limited, Tokyo, Japan**

**No Drawing. Filed June 9, 1972, Ser. No. 261,429**

**Claims priority, application Japan, June 10, 1971, 46/41,347**

**Int. Cl. C07c *149/18***

**U.S. Cl. 260—609 B** **4 Claims**

Multiple tank-stirred-flow-reactors connected in series, which allow control of specific reaction conditions, are used in a continuous preparation of a thioether by reacting an $\alpha$-olefin having 8–20 carbon atoms with a mercapto compound having the formula:

RSH

wherein R represents mono-, di- or tri-hydroxyalkyl groups having 2–5 carbon atoms in the presence of air as a radical initiator.

3,819,719

## PRODUCTION OF ALKOXY PHENOLIC COMPOUNDS

Allan B. McKague, Vancouver, British Columbia, William de Waal, Richmond, British Columbia, and Carl E. Van Winckel, West Vancouver, British Columbia, Canada; said McKague and de Waal assignors to said Van Winckel, doing business as The Orchem Research Company, Burnaby, British Columbia, Canada

No Drawing. Continuation-in-part of application Ser. No. 233,795, Mar. 10, 1972, which is a continuation-in-part of application Ser. No. 124,449, Mar. 15, 1971, both now abandoned. This application May 8, 1972, Ser. No. 251,132

Int. Cl. C07c *41/00*

U.S. Cl. 260—613 D 14 Claims

Alkoxy phenols such as o-methoxyphenol (guaiacol) and o-ethoxyphenol are prepared from substituted cycloaliphatic ketones by dehydrogenation thereof in the presence of a Group VIII noble metal catalyst, preferably palladium supported on carbon, at a temperature of 150° C., to 250° C. The reaction is carried out neat or in the liquid phase using an alicyclic ester reaction solvent having a boiling point ranging from about 150° C., to 250° C. The substituted cycloaliphatic ketone reactant, such as 2-chlorocyclohexanone is prepared by chlorination of cyclohexanone with subsequent conversion of the 2-chlorocyclohexanone to the alkoxy-cyclohexanone compound which is dehydrogenated.

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3,819,720

## SUBSTITUTED TETRAMETHOXY DERIVATIVES

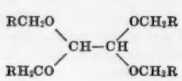
Jonathan M. Kliegman, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

No Drawing. Filed Aug. 16, 1972, Ser. No. 281,160

Int. Cl. C07c *43/30*

U.S. Cl. 260—615 A 1 Claim

Novel compounds represented by the formula:



wherein R is

, $-CH_2OCH_2CH=CH_2$, and $-CH=CH(CH_2)_3CH=CH_2$

and wherein all of the R substituents in the molecule are the same. The compounds have utility as reactive solvents in coating formulations.

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3,819,721

## PREPARATION OF HALOADAMANTANES

Robert E. Moore, Wilmington, Del., and Gary L. Driscoll, Delaware, Pa., assignors to Sun Research and Development Co., Philadelphia, Pa.

No Drawing. Filed Dec. 17, 1968, Ser. No. 784,480

Int. Cl. C07c *35/22*

U.S. Cl. 260—617 F 33 Claims

Halogenated derivatives containing the adamantane nucleus are produced by admixing, in the presence of strong sulfuric acid, monools or diols of adamantanes or alkyladamantanes with a selected halo-yielding salt of an alkali or alkaline earth metal, or a corresponding hydrogen halide.

3,819,722

## 2-PHENYL-1,1-DIHALO-ALKANE-2-OLS

Daniel Bertin, Montrouge, and Jacques Perronnet and André Teche, Paris, France, assignors to Roussel-UCLAF, Paris, France

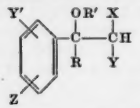
No Drawing. Filed Dec. 31, 1969, Ser. No. 889,711

Claims priority, application France, Jan. 7, 1969, 6900090

Int. Cl. C07c *31/16*

U.S. Cl. 260—618 D 12 Claims

Halogenated compounds of formula I



(I)

wherein R represents a lower alkyl radical, saturated or not, X is chlorine or bromine, Z is chlorine or bromine, Y′ is hydrogen, chlorine, bromine lower alkyl or nitro group, R′ is hydrogen, acyl, alkyl sulfonyl or aryl sulfonyl, which possess pesticidal properties, process for their preparation, pesticidal compositions containing them, and their use.

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3,819,723

## DERIVATIVES OF DIBENZO (a,b) 5H-CYCLOHEPTENE, METHOD OF PREPARATION, AND APPLICATION THEREOF

Frajda Dvolaitzky, Paris, Jean-Claude Cognacq, Bourg-la-Reine, and Esther Ber, Paris, France, assignors to Societe Civile Auguil, Paris, France

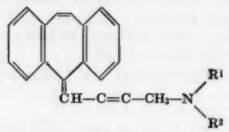
No Drawing. Original application May 20, 1970, Ser. No. 39,148, now Patent No. 3,723,420, dated Mar. 27, 1973. Divided and this application Aug. 18, 1972, Ser. No. 281,900

Claims priority, application France, May 20, 1969, 6916251

Int. Cl. C07c *33/06*

U.S. Cl. 260—618 R 2 Claims

New chemical compounds of the formula



wherein $R^1$ and $R^2$ are each selected from the group consisting of alkyl or hydroxyalkyl, or where

forms part of a heterocycle; and acid addition salts thereof. These compounds are active on the central nervous system and on the cardiovascular system.

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3,819,724

## PROCESS FOR THE CONVERSION OF CARBON TO ALCOHOLS

Alberto E. Veloso, Quezon City, Philippines, assignor to Internationale Erfinder- und Patentanstalt, Vaduz, Liechtenstein

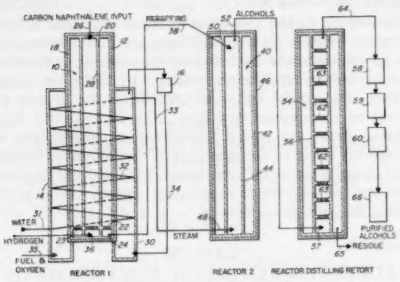
Filed Oct. 20, 1970, Ser. No. 82,421

Int. Cl. C07c *31/02*; C10l *1/02*

U.S. Cl. 260—632 CB 2 Claims

A process for the preparation of alcohols from purified carbon, including the step of hydrogenating the carbon

at high temperature and pressure in a catalytic reactor in a dispersion with naphthalene and in the presence of a catalyst comprising nickel, ruthenium, aluminum and cobalt molybdate, and the step of oxidizing the resulting paraffins by contact with steam at high temperature and pressure in a catalytic reactor in the presence of a catalyst




comprising a mixture of silica and copper and the oxides of zinc, chromium and boron. The catalysts are suspended in a ceramic concrete aggregate, extending the length of the reactors and in the form of a cylindrical reactor liner and a smaller, concentric ceramic cylinder therewithin. The second step is performed in two reactors in series.

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**3,819,725**

## PROCESS FOR THE PREPARATION OF ALKYL SUBSTITUTED RESORCINOLS

**Arnold Brossi, Verona, and Antonino Focella and Sidney Teitel, Clifton, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.**

**No Drawing. Original application Jan. 22, 1969, Ser. No. 793,191, now abandoned. Divided and this application Sept. 16, 1971, Ser. No. 181,200**

**Int. Cl. C07c** *39/08*

**U.S. Cl. 260—625** **4 Claims**

Preparation of 5-alkyl substituted resorcinols such as Olivetol from aliphatic aldehydes and intermediates in this process.

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**3,819,726**

## PREPARATION OF URUSHIOL FROM POISON IVY OR POISON OAK

**Ranbirsingh G. Khurana, New York, N.Y., and Charles R. Dawson, Leonia, N.J., assignors to the United States of America as represented by the Secretary, Department of Health, Education, and Welfare**

**No Drawing. Filed July 24, 1972, Ser. No. 274,291**

**Int. Cl. C07c** *39/08*

**U.S. Cl. 260—625** **8 Claims**

A method for the preparation of urushiol from poison ivy or poison oak is disclosed. The method includes extraction with alcohol at low temperature and a second extraction with benzene, followed by chromatographic separation on a solid adsorbent. The method includes the use of a pure nitrogen atmosphere in all operations and the minimized use of elevated temperatures to avoid altering the structure of urushiol components.

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**3,819,727**

## PROCESS FOR THE SYNTHESIS OF ALCOHOLS

**Giuseppe Ferrari and Pier Luigi Griselli, Ferrara, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy**

**No Drawing. Filed Apr. 22, 1971, Ser. No. 136,562**

**Claims priority, application Italy, Apr. 23, 1970, 23,755/70**

**Int. Cl. C07c** *28/16*

**U.S. Cl. 260—638 HF** **8 Claims**

Alcohols are directly synthesized from olefins by oxo-reaction in a process comprising a hydroformylation phase and a hydrogenation phase in which both phases proceed in the presence of an oxo-reaction catalyst, more particularly cobalt carbonyls or carbonylable cobalt salts, and the hydrogenation phase is carried out in the presence of from 5% to 15% by volume of water, based on the volume of the olefin, and, optionally, in the presence of an organic acid.

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**3,819,728**

## PURIFICATION OF CRUDE PRIMARY ALCOHOLS

**Arien Kwantes and Bernhard Stouthamer, Amsterdam, Netherlands, assignors to Shell Oil Company, New York, N.Y.**

**No Drawing. Filed May 18, 1972, Ser. No. 254,596**

**Claims priority, application Netherlands, Nov. 30, 1971, 7116417**

**Int. Cl. C07c** *29/24, 69/82*

**U.S. Cl. 260—643 B** **6 Claims**

Crude primary alkanols of at least six carbon atoms per molecule containing aldehydes or acetals and sulfur compounds as contaminants ar purified by a process which comprises contacting the crude primary alkanol with hydrogen under pressure in the presence of a supported hydrogenation catalyst containing a noble metal of Group VIII in two successive stages wherein the initial stage is conducted in the presence of sufficient dissolved water to decompose the acetal contaminant present and at a temperature of between about 200° and about 220° C., and the subsequent stage is conducted at a temperature of between about 150° and about 180° C.

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**3,819,729**

## PROCESS FOR PRODUCING 1-CHLORO-1-FLUOROETHYLENE

**Chiyuki Fujii, Yamoto, Tsutomu Sinike, Hirakata, and Yoshiharu Inoue, Tokyo, Japan, assignors to Denki Kagaku Kogyo K.K., Tokyo, Japan**

**No Drawing. Filed Aug. 2, 1971, Ser. No. 168,408**

**Claims priority, application Japan, Aug. 21, 1970, 45/73,292**

**Int. Cl. C07c** *17/00, 21/18*

**U.S. Cl. 260—653.3** **4 Claims**

1-chloro-1-fluoroethylene is produced by dehydrogenating 1-chloro-1-fluoroethane by vapor phase thermal decomposition with chlorine at a temperature of from 300°–700° C.

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**3,819,730**

## PROCESS FOR DICHLOROBUTENE ISOMERIZATION

**Bruce Tadashi Nakata and Eugene Dennis Wilhoit, Victoria, Tex., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.**

**No Drawing. Filed Nov. 30, 1971, Ser. No. 203,476**

**Int. Cl. C07c** *21/04*

**U.S. Cl. 260—654 R** **6 Claims**

An improved process for the isomerization of 1,4-dichlorobutene-2 to 3,4-dichlorobutene-1, or vice versa, by heating the butene compound in the presence of a copper salt complexed with an organic quaternary ammonium compound.

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**3,819,731**

## PRODUCTION OF CHLORINATED UNSATURATED HYDROCARBONS

**Harold M. Pitt, Lafayette, and Harry Bender, El Cerrito, Calif., assignors to Stauffer Chemical Company**

**No Drawing. Continuation-in-part of abandoned application Ser. No. 16,946, Mar. 23, 1960. This application Feb. 16, 1961, Ser. No. 89,640**

**Int. Cl. C07c** *21/00, 21/02, 21/14*

**U.S. Cl. 260—654 R** **12 Claims**

This invention relates to the production of partially chlorinated hydrocarbons by reacting perchloroethylene or trichloroethylene, in the vapor phase, with methyl chloride, ethane, propylene, toluene or p-xylene.

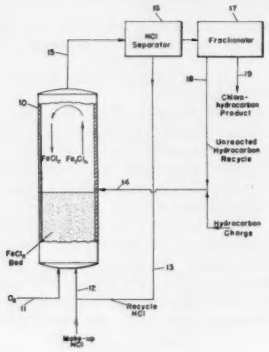
## 3,819,732
## CHLORINATION OF HYDROCARBONS

**Walter L. Borkowski and John J. van Venrooy, Media, and Walter H. Seitzer, West Chester, Pa., assignors to Sun Research and Development Co., Philadelphia, Pa.**

**Original application Jan. 23, 1967, Ser. No. 621,379. Divided and this application Sept. 22, 1969, Ser. No. 859,982**

**Int. Cl. C07c *17/00***

**U.S. Cl. 260—659 A** **7 Claims**




Compounds containing hydrogen bonded to carbon are chlorinated in vapor phase when introduced at an intermediate level into a reactor maintained at a temperature in the range of 315–500° C. and containing a bed of ferrous chloride which by interaction with HCl and oxygen is used to produce ferric chloride vapor which is contacted with the C—H containing compound to produce HCl, a C—Cl group, and solid $FeCl_2$ which falls to the bed. When the bed of ferrous chloride gradually converts to oxygenated iron compound, the bed can be periodically regenerated by increasing the proportion of $HCl:O_2$ and continuing to operate at the high $HCl:O_2$ molar proportion until substantially all of the oxygenated iron compound has been converted to iron chloride.

## 3,819,733
## PROCESS FOR THE PREPARATION OF NON-CONJUGATED DIENIC GRIGNARD REAGENTS AND THEIR UTILIZATION IN ORGANIC SYNTHESES

**Hugh E. Ramsden, Scotch Plains, N.J., assignor to Rhodia, Inc., New York, N.Y.**

**No Drawing. Filed Mar. 6, 1972, Ser. No. 232,254**

**Int. Cl. C07f *3/02***

**U.S. Cl. 260—665 G** **11 Claims**

A process is provided for the preparation of non-conjugated dienic Grignard reagents which are useful in organic syntheses and particularly for the preparation of complex terpenic alcohols, such as lavandulol. A mono conjugated diene magnesium compound and an allyl halide are reacted in the presence of a cyclic ether to form the nonconjugated dienic Grignard reagent. To form a terpenic alcohol such as lavandulol, a mono diene magnesium such as isoprene magnesium and a diene hydrohalide such as prenyl halide are reacted, and the resulting Grignard reagent is then treated with oxygen and hydrolyzed, to form, for example, lavandulol.

## 3,819,734
## HYDROGENATION PROCESS

**Vipin M. Kothari, Akron, and James J. Tazuma, Stow, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio**

**No Drawing. Filed May 5, 1972, Ser. No. 250,801**

**Int. Cl. C07c *5/06***

**U.S. Cl. 260—666 A** **7 Claims**

According to the invention there is provided a highly activated process for the hydrogenation of cyclopentadiene to cyclopentene by bringing the cyclopentadiene into contact with a catalyst comprising (1) nickel on a metal oxalate, said metal being selected from the groups consisting of magnesium and zinc, (2) at least one ligand selected from the group consisting of phosphines and phosphites while in the presence of hydrogen at temperatures from about 0° C. to about 200° C. and hydrogen pressure ranging from about 0 to about 10,000 pounds per square inch gauge (p.s.i.g.).

## 3,819,735
## ALKYLATION CATALYST AND PROCESS OF ALKYLATING BENZENE

**Benny J. Argento, South Charleston, and Edward A. Rick, Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.**

**No Drawing. Filed Feb. 4, 1972, Ser. No. 223,781**

**Int. Cl. C07c *3/56, 3/62***

**U.S. Cl. 260—671 P** **7 Claims**

The disclosure of this application is directed to a liquid alkylation catalyst which is based on aluminum chloride; and to a process of alkylating benzene with propylene or *n*-butene to form isopropylbenzene (cumene) or secondary butylbenzene and transalkylating, to isopropylbenzene or secondary butylbenzene, the corresponding dialkylbenzene formed as a by-product in the reaction mixture by: contacting a reaction mixture containing benzene and propylene or an *n*-butene or mixtures of propylene and *n*-butene with a sufficient amount of a liquid alkylation catalyst, as previously described, to provide a concentration of aluminum chloride in the reaction mixture of about 0.05 to about 0.25 percent by weight.

## 3,819,736
## PROCESS FOR CONVERSION OF ALKYL AROMATIC HYDROCARBONS

**Yuji Sato and Hideyuki Takahashi, both % Mitsubishi Petrochemical Co., Ltd., Technical Development Research Laboratory, 1 Toho-cho, Yokkaichi, Japan**

**No Drawing. Continuation-in-part of abandoned application Ser. No. 142,405, May 11, 1971. This application Nov. 14, 1972, Ser. No. 306,290**

**Int. Cl. C07c *3/62***

**U.S. Cl. 260—672 T** **5 Claims**

A disproportionation and transalkylation of an alkyl-aromatic hydrocarbon can be conducted by use of a supported catalyst of a mordenite carrying a combination of Zr and another metal selected from the group consisting of Bi, Nb, Ag, Cu, Mo, Sb and Y.

## 3,819,737
## EXTRACTIVE DISTILLATION OF CITRUS LIMONENE

**Karl Alfred Kubitz and Alfred Frederick Wicke, Jr., Pensacola, Fla., assignors to Reichhold Chemicals, Inc., White Plains, N.Y.**

**No Drawing. Filed Aug. 6, 1973, Ser. No. 385,636**

**Int. Cl. C09f *3/02***

**U.S. Cl. 260—675.5** **13 Claims**

Limonene and citrus flavor and odor concentrate are separated and recovered from crude citrus limonene by a process of extractive distillation.

3,819,738

## ALKYNES REMOVAL FROM HYDROCARBON STREAMS

Darryl R. Fahey and Donald H. Kubicek, Bartlesville, Okla., assignors to Phillips Petroleum Company

No Drawing. Filed Sept. 25, 1972, Ser. No. 291,614
Int. Cl. C07c *11/00*
U.S. Cl. 260—677 A 10 Claims

A method of removing alkynes from hydrocarbon streams which involves passing the hydrocarbon stream into contact with a base-treated, molybdenum-promoted or tungsten-promoted alumina or silica to convert the alkynes to higher molecular weight compounds.

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3,819,739

## ALKYNE REMOVAL FROM HYDROCARBON STREAMS

Darryl R. Fahey, Bartlesville, Okla., assignor to Phillips Petroleum Company

No Drawing. Filed Nov. 16, 1972, Ser. No. 307,024
Int. Cl. C07c *11/00*
U.S. Cl. 260—677 A 12 Claims

Catalysts having the formula $[CO_2(CO)_6L_2]$ or

$$[Co(CO)_3L_2][Co(CO)_4]$$

are employed to remove alkynes having from 2 to 20 carbon atoms from hydrocarbon streams.

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3,819,740

## PROCESS FOR THERMALLY CRACKING HYDROCARBONS

Saburo Hori, Iwaki, Japan, assignor to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 2, 1971, Ser. No. 177,384
Claims priority, application Japan, Sept. 3, 1970, 45/76,654
Int. Cl. C07c *11/24*
U.S. Cl. 260—679 R 6 Claims

In thermal cracking of hydrocarbons by bringing petroleum hydrocarbons into contact with a high temperature heat medium to effect thermal cracking of the hydrocarbons, a thermal cracking apparatus equipped with an ultrasonic wave generator is applied to give a mixture of the petroleum hydrocarbons and the high temperature heat medium in the thermal cracking reaction zone ultrasonic wave vibration having a power of 0.01–10 watts/cm.$^2$ and a frequency of 1–800 kHz. The ultrasonic wave generator is so designed that it may be protected from the high temperature heat medium by a fluid maintained at a temperature lower than that of the medium. When petroleum hydrocarbons are thermally cracked by application of a thermal cracking apparatus equipped with such an ultrasonic wave vibrator, build-up of carbon or coke on the wall of reaction chamber is effectively prevented and the yield of the thermally cracked product is increased.

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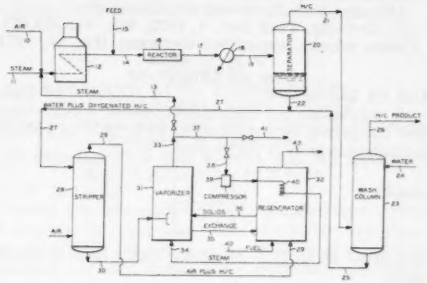
3,819,741

## PURIFICATION PROCESS FOR A HYDROCARBON CONVERSION EFFLUENT

Robert M. Marsheck and Forrest L. Poska, Bartlesville, Okla., assignors to Phillips Petroleum Company

Filed Sept. 8, 1971, Ser. No. 178,555
Int. Cl. C07c *7/02, 11/16*
U.S. Cl. 260—680 E 12 Claims

Liquid streams containing impurities are freed of the impurities by contacting the liquid stream with particulate materials for deposition of the impurity onto the particulate material and subsequently subjecting the particulate material having deposited theeron the impurities to an elevated temperature and an oxygen-containing gas to oxidize and burn off the impurities from the particulate solids and converting impurities to innocuous materials which can be discharged to the atmosphere. In one embodiment, aqueous streams containing oxygenated hydrocarbon impurities are contacted with particulate solids, either inert or catalytic solids, for deposition of the oxygenated hydrocarbons and subsequently subjecting the solids and deposited oxygenated hydrocarbons to oxidation and combustion in a fluidized bed operation to convert the oxygenated hydrocarbons to carbon oxides and water which can be readily discharged to the atmosphere.

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3,819,742

## PROCESS FOR SEPARATING HYDROCARBONS

Jean-Pierre Brun, 16 We du Pare, 91 Orsay, France; Gérard Bulvestre, 32 Fg des Chartreux, 94 Mandres-les-Roses, France; Michel Juillou, Iut Av du General de Gaulle, 94 Creteil, France; Pierre Thirion, 12 We Debergue, 78 Bougival, France; and René Pautrat, Rinderie Nahonah 5 We Bay, 72 Le Mans, France

Filed Oct. 28, 1971, Ser. No. 193,494
Claims priority, application France, Nov. 3, 1970, 7039537
Int. Cl. B01d *13/00*; C07c *7/00*
U.S. Cl. 260—681.5 R 26 Claims

The invention relates to a process for separating mixtures of hydrocarbons, notably conjugated diene hydrocarbons, from mixtures containing the same, by the general technique of permeation or pervaporation through specific membranes.

The specific membranes used are formed of a high polymer comprising functional groups chemically combined by covalent bonding within the polymer forming the said membrane, the said groups possessing a physiochemical affinity, notably a capacity to complex, with respect to one of said hydrocarbons and, substantially, the absence of such a capacity with respect to other hydrocarbons of the mixture. For the separation of dienes, such as butadiene and pentadiene, membranes are used containing active nitrile, pyrrolidone, N-substituted groups, such as N-alkyl groups, notably N-methyl or N-methyl-pyrrolidone. The membrane can be obtained, for example, from a vulcanized butadiene-acrylonitrile rubber, which can contain about 5 to 60% acrylonitrile, and notably from 20 to 30%.

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3,819,743

## ALKYLATION OF HEPTANES WITH ISOBUTANE USING ANTIMONY PENTAFLUORIDE-FLUOROSULFONIC ACID MIXTURES

David A. McCaulay, Homewood, Ill., assignor to Standard Oil Company, Chicago, Ill.

Filed Dec. 15, 1972, Ser. No. 315,516
Int. Cl. C07c *3/54, 3/56*
U.S. Cl. 260—683.47 4 Claims

A hydrocarbon conversion process involving alkylation and disproportionation of low octane $C_7$ alkane streams in the presence of isobutane to form higher octane mixtures of predominantly saturated hydrocarbons, said process utilizing a mixture of fluorosulfonic acid and antimony pentafluoride as a catalyst.

## 3,819,744
## POLYDIORGANOSILOXANE-POLYCARBONATE BLOCK COPOLYMERS

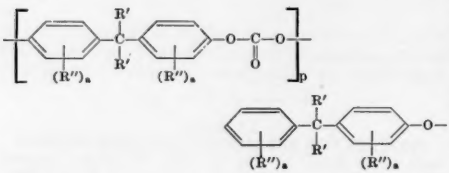
Werner Büchner, Leichlingen, Walter Noll, Opladen, and Bernd Bressel, Cologne, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Dec. 7, 1972, Ser. No. 313,073
Claims priority, application Germany, Dec. 16, 1971, P 21 62 418.0
Int. Cl. C08g 47/02
U.S. Cl. 260—824 R 5 Claims

A polydiorganosiloxane-polycarbonate block copolymer comprising by weight about 20 to 90% of polydiorganosiloxane units of the formula

(I)

and about 80 to 10% of polycarbonate units of the formula



(II)

the copolymer having terminal groups of the formula

(III)

wherein

each R independently is a monovalent optionally substituted aliphatic, cycloaliphatic, araliphatic or aromatic hydrocarbon radical with 1 to 12 carbon atoms,
each R′ independently is hydrogen or a monovalent optionally substituted aliphatic, cycloaliphatic, araliphatic or aromatic hydrocarbon radical with 1 to 12 carbon atoms,
each R″ independently is a lower alkyl radical or a halogen atom,
each X is a halogen atom, a hydroxyl radical or lower alkoxy radical,
*n* is an integer from 2 to 100,
*p* is an integer from 1 to 7, and
*a* is an integer from 0 to 4.

The copolymers are produced by reacting 1 mole of an α,ω-dihydroxypolycarbonate, dissolved in an inert organic solvent, with about 1.05 to 2 moles of an α,ω-dichloropolydiorganosiloxane in the presence of a quantity of a tertiary amine stoichiometrically equivalent to the chlorine content of the α,ω-dichloropolydiorganosiloxane at a temperature up to about 100° C., filtering off the amine-salt and removing the solvent.

## 3,819,745
## COATINGS GIVING CONTROLLED RELEASE

Floyd A. Plante, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.

No Drawing. Filed Mar. 27, 1972, Ser. No. 238,668
Int. Cl. C08g 47/04, 47/10
U.S. Cl. 260—825 19 Claims

A composition consisting essentially of a copolymer composed of $SiO_2$ units and $(CH_3)_3SiO_{1/2}$ units and a block copolymer consisting of an essentially linear portion and an essentially resinous portion has been found useful as a release coating on various substrates especially cellulosic substrates to obtain controlled release values.

## 3,819,746
## CATALYSIS OF OXIRANE-IMIDE SYSTEMS

Arthur Katzakian, Jr., Sacramento, and Roger B. Steele, Fair Oaks, Calif., assignors to Aerojet-General Corporation, El Monte, Calif.

No Drawing. Filed Jan. 14, 1972, Ser. No. 218,015
Int. Cl. C08g 45/00
U.S. Cl. 260—830 TW 8 Claims

This patent describes a novel storable epoxy-imide resin precursor comprising a curable oxirane monomer and an imide, the improvement wherein the system is provided with an activated chromium III tricarboxylate salt catalyst which contains available coordination sites, and which sites are rendered unavailable in the presence of certain non-reactive, removable electron donating solvents. That is to say, the catalyst compound, in the presence of particular solvents is rendered noncatalytic; on the removal of said solvents, catalytic activity is restored. These solvents include but are not limited to such polar electron coordinating solvents as removable methanol, ethanol, N,N-dimethyl formamide, dioxane, tetrahydrofuran, dimethyl sulfoxide, dimethyl sulfolane, nitro alkanes, nitro aromatics, tetramethyl urea, N,N-dimethylacetamide, N-methylcaprolactam and N-methyl pyrrolidone. Upon the removal of only the solvent as by evaporation, the activity of the catalyst is restored, by the formation of unoccupied coordination sites, whereby the reaction of the oxirane compound with the imide can take place.

## 3,819,747
## HYDROGEN SULFIDE-MODIFIED EPOXY RESINS AND FLEXIBLE LAMINATES THEREFROM

James L. Bertram, Lake Jackson, Ross C. Whiteside, Jr., Angleton, and Preston H. Franke, Jr., Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Continuation-in-part of abandoned application Ser. No. 185,893, Oct. 1, 1971. This application Feb. 23, 1973, Ser. No. 335,380
Int. Cl. C08g 45/06
U.S. Cl. 260—830 TW 8 Claims

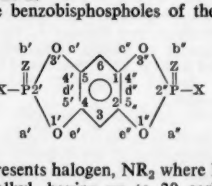
Mixtures of the diglycidyl ethers of a bisphenol such as bisphenol A and a diglycidyl ether of an aliphatic polyhydroxyl containing compound such as the diglycidyl ether of neopentyl glycol are modified with hydrogen sulfide to produce epoxy resins which when cured with an aminated polyglycol are useful in the preparation of flexible laminates.

## 3,819,748
## PHOSPHORUS DERIVATIVES OF TETRAFUNCTIONAL AROMATIC COMPOUNDS

Lothar G. Dulog, Sint Martens Latem, and Sylvain A. R. Dewaele, Evergem, Belgium, assignors to S.A. Texaco Belgium N.V., Brussels, Belgium

No Drawing. Filed May 5, 1972, Ser. No. 250,712
Int. Cl. C07f 9/24
U.S. Cl. 260—927 R 10 Claims

Disclosed are benzobisphospholes of the formula:



wherein: X represents halogen, $NR_2$ where R is hydrogen, alkyl, or cycloalkyl, having up to 30 carbon atoms or aryl or aralkyl having up to 22 carbon atoms, pyrrolidino, piperidino or morpholino; Z is oxygen or sulfur or may be absent.

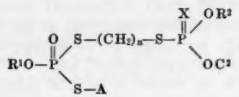
These compounds are effective as anti-wear and anti-oxidant additives for lubricating oils. They also have flame retardant properties.

## 3,819,749
## PHOSPHORIC ESTERS

**Hans Urbach, 10 Am Weingarten, 6840 Lampertheim, Germany, and Heinrich Adolphi, 11 Kalmitweg, 6703 Limburgerhof, Germany**

**No Drawing. Filed Feb. 25, 1972, Ser. No. 229,560**
**Claims priority, application Germany, Mar. 1, 1971, P 21 09 492.8**
**Int. Cl. A01n** *9/36;* **C07f** *9/08*
**U.S. Cl. 260—928** **2 Claims**

Compounds, useful as pesticides, of the formula



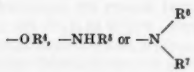
wherein:

$R^1$ and $R^2$ are alkyl of 1 to 4 carbon atoms; X is oxygen or sulfur;

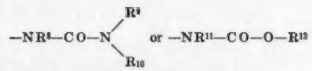
*n* is 0, 1, 2 or 3;

A is an optionally substituted alkyl, alkenyl, or alkynyl of 1 to 5 carbon atoms, or the radical

in which B is



$R^4$, $R^5$, $R^6$ and $R^7$ being alkyl, alkenyl, or alkynyl of 1 to 4 carbon atoms or alkoxyalkyl, or $R^6$ and $R^7$, together with the nitrogen atom whose substituents they are, being a ring which may be substituted by hetero atoms, B further being the radical



$R^8$, $R^9$, $R^{10}$, $R^{11}$ and $R^{12}$ being hydrogen or lower alkyl and in which $R^3$ is hydrogen, alkoxyalkyl of 2 to 6 carbon atoms or the radical

with D having the same meaning as B, or D and B together being the radical —$NR^{13}$—CO—$NR^{14}$, $R^{13}$ and $R^{14}$ being hydrogen or lower alkyl.

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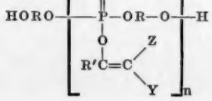
## 3,819,750
## POLYALKYLENE GLYCOL VINYL PHOSPHATES

**Kyung S. Shim, Irvington, N.Y., assignor to Stauffer Chemical Company, New York, N.Y.**

**No Drawing. Continuation-in-part of abandoned application Ser. No. 63,262, Aug. 6, 1970. This application Nov. 2, 1970, Ser. No. 86,313**
**Int. Cl. C07f** *9/08, 45/58;* **C08g** *22/44*
**U.S. Cl. 260—929** **8 Claims**

Polyalkylene glycol vinyl phosphates having the formula:



where R is a polyalkylene glycol residue, *n* is an integer from 1 to about 100, R′ is either hydrogen, alkyl or haloalkyl, and Z and Y are each either halogen, hydrogen or alkyl are produced by transesterifying a tertiary phosphite with a polyalkylene glycol and reacting the product thereof with a carbonyl compound.

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## 3,819,751
## DIALKYL ACYL PHOSPHONATE, O-(ALKYLCARBAMOYL) OXIMES

**William D. Dixon, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.**

**No Drawing. Filed Dec. 6, 1971, Ser. No. 210,225**
**Int. Cl. A01n** *9/36;* **C07f** *9/40*
**U.S. Cl. 260—938** **2 Claims**

Dialkyl acyl phosphonate, O-(alkylcarbamoyl)oximes are prepared by reacting an oxime of a dialkyl acyl phosphonate with an isocyanate in the presence of a catalytic amount of a trialkyl amine. These compounds are pesticidally active and particularly useful as pre-emergent herbicides and insecticides.

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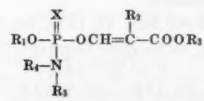
## 3,819,752
## O-ACRYLIC ACID ESTER-O-ALKYL-(THIO)-PHOSPHONIC AMIDES

**Ernst Beriger, Neu-Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.**

**No Drawing. Filed July 7, 1972, Ser. No. 269,904**
**Claims priority, application Switzerland, July 22, 1971, 10,888/71; May 30, 1972, 7,969/72**
**Int. Cl. A01n** *9/36;* **C07f** *9/24*
**U.S. Cl. 260—941** **3 Claims**

O-Acrylic acid ester-O-alkyl-(thio)-phosphonic amides of the formula



wherein $R_1$ represents $C_1$–$C_4$ alkyl, $R_2$ represents hydrogen or $C_1$–$C_2$ alkyl, $R_3$ represents $C_1$–$C_6$ alkyl, $C_2$–$C_6$ alkenyl, $C_2$–$C_6$ alkinyl, unsubstituted or substituted phenyl or aralkyl, $R_4$ and $R_5$ each represent hydrogen, $C_1$–$C_4$ alkyl, $C_2$–$C_5$ alkenyl or $C_2$–$C_5$ alkinyl and X represents oxygen or sulphur, their manufacture and their use in pest control.

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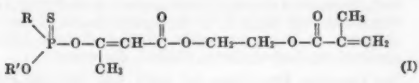
## 3,819,753
## O-VINYL-THIONOPHOSPHORIC(-PHOSPHONIC) ACID ESTERS

**Hans-Jochem Riebel, Wuppertal, Dieter Brokmeier, Dormagen, and Ingeborg Hammann, Cologne, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany**

**No Drawing. Filed Nov. 2, 1972, Ser. No. 303,303**
**Claims priority, application Germany, Nov. 13, 1971, P 21 56 446.5**
**Int. Cl. A01n** *9/36;* **C07f** *9/08, 9/36*
**U.S. Cl. 260—942** **6 Claims**

O-vinyl-thionophosphoric(-phosphonic) acid esters of the formula



(I)

in which

R is an alkyl or alkoxy radical having 1 to 6 carbon atoms or a phenyl radical, and

R′ is an alkyl radical having 1 to 6 carbon atoms,

which possess insecticidal and acaricidal properties.

3,819,754

## AMIDOTHIONOPHOSPHONIC ACID ESTERS

Masahiro Aya and Shigeo Kishino, Tokyo, Akio Kudamatsu, Kanagawa, Nobuo Fukazawa and Toyohiko Kume, Tokyo, and Kozo Shiokawa, Kanagawa, Japan, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

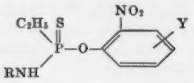
No Drawing. Filed Nov. 10, 1971, Ser. No. 197,524

Claims priority, application Japan, Nov. 17, 1970, 45/100,850

Int. Cl. A01n 9/36; C07f 9/24

U.S. Cl. 260—954 17 Claims

Novel amidothionophosphonic acid ester compounds of the formula



(I)

wherein R is lower alkyl or cycloalkyl; and Y is hydrogen, halogen or lower alkyl

are outstandingly effective as herbicides and exhibit particular selective action, e.g., against weeds growing in rice paddies.

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3,819,755

## O,O-DIALKYL-O-(4-TRIFLUOROMETHYLPHENYL)-THIONOPHOSPHORIC ACID ESTERS

Horst Tarnow, Leverkusen, Klaus Sasse, Schildgen, Bernhard Homeyer, Opladen, and Wolfgang Behrenz, Cologne, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

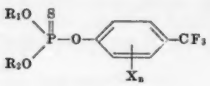
No Drawing. Filed Sept. 27, 1972, Ser. No. 292,579

Claims priority, application Germany, Oct. 2, 1971, P 21 49 312.9

Int. Cl. A01n 9/36; C07f 9/16

U.S. Cl. 260—955 8 Claims

O,O-dialkyl-O-(4 - trifluoromethylphenyl)-thionophosphoric acid esters of the formula



(I)

in which

$R_1$ and $R_2$ each independently is lower alkyl,
X is chlorine or bromine, and
*n* is an integer from 0 to 4,

which possess nematocidal, insectidal, acaricidal, fungicidal and herbicidal properties.

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3,819,756

## DITHIOPHOSPHORIC ESTERS

Peter Beutel, Mannheim, Karl-Heinz Koenig, Frankenthal, Heinrich Adolphi, Limburgerhof, Falk Rittig, Ludwigshafen, and Hans Urbach, Lampertheim, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed May 24, 1972, Ser. No. 256,479

Int. Cl. A01n 9/36; C07f 9/16

U.S. Cl. 260—956 3 Claims

New and valuable dithiophosphoric triesters having a strong insecticidal and nematocidal action and a process for controlling pests with these compounds.

3,819,757

## COATING COMPOSITIONS

Jorg Dorffel, Lippramsdorf, and Uwe Biethan, Marl, Germany, assignors to Chemische Werke Huels Aktiengesellschaft, Marl, Germany

No Drawing. Filed Aug. 28, 1972, Ser. No. 283,965

Claims priority, application Germany, Sept. 18, 1971, P 21 46 754.9

Int. Cl. C08g 37/34

U.S. Cl. 260—850 8 Claims

Coating compositions containing, as the binder

(A) 45–15% by weight of an aminoplast or a low-molecular precursor thereof; and

(B) 55–85% by weight of at least difunctional esters containing predominantly hydroxyl groups and optionally carboxyl groups as the functional groups and having an average molecular weight of less than 600 and produced by the esterification of

I. an alcohol reactant consisting essentially of:

(1) 0–50 molar percent of one or more aliphatic polyols of 3 or 4 hydroxyl groups and 3–6 carbon atoms, and

(2) 100–50 molar percent of a diol component consisting essentially of: (a) at least 70 molar percent of one or both of ethylene glycol and 1,2-propanediol, and (b) up to 30 molar percent of one or more other aliphatic or cycloaliphatic diols whose hydroxyl groups are separated by 2–8 carbon atoms, and 0 to 2 of the carbon atoms in the chain are substituted by oxygen atoms which are separated from each other and from the hydroxyl groups by at least 2 carbon atoms, and

II. an acid mixture consisting essentially of:

(1) 80–200 molar percent of one or more aromatic or cycloaliphatic dicarboxylic acids whose carboxyl groups are positioned ortho or meta or a functional acid derivative thereof convertible to an ester of the alcohol reactant, and

(2) 20–80 molar percent of at least one saturated aliphatic dicarboxylic acid of 4–12 carbon atoms or a functional acid derivative thereof convertible to an ester of the alcohol reactant are cured at low temperatures without loss of baking stability employing as curing catalyst 0.7–2% by weight of one or both of maleic acid and oxalic acid.

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3,819,758

## POLYOLEFIN RENDERED DYE, RECEPTIVE WITH CAPPED POLYAMIDE, POLYAMIDO OR POLYESTER

James W. Cleary, Bartlesville, Okla., assignor to Phillips Petroleum Company

Original application Apr. 14, 1969, Ser. No. 815,914, now abandoned. Divided and this application Dec. 2, 1971, Ser. No. 210,167

The portion of the term of the patent subsequent to Nov. 18, 1988, has been disclaimed

Int. Cl. C08g 41/04

U.S. Cl. 260—857 L 2 Claims

Polyamides, polyamidoesters or polyesters which have been capped, so that there remain substantially no free carboxylic acid groups in the molecules, as by reaction of the polymer molecule with a primary or secondary monoamine and/or a monocarboxylic acid either during the basic reaction forming the polymer or thereafter, and used as improved dye receptors in a polyolefin, e.g.

polypropylene, have been found to considerably improve and visually noticeably to the dye receptivity and dye retention of the polyolefin.

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3,819,759

## POLYESTER MOLDING COMPOSITIONS WITH TRIARYL PHOSPHATE AND A POLYPHENYLENE OXIDE OR A POLYCARBONATE OF BISPHENOL A

James C. Weaver, Theodore F. Gray, Jr., and Robert L. Combs, Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Oct. 6, 1972, Ser. No. 295,623
Int. Cl. C08g *39/10*
U.S. Cl. 260—860 3 Claims

Tricomponent blends of copoly(bisphenol A terephthalate/isophthalate), triaryl phosphate and either poly-(2,6-dimethyl phenylene oxide) or bisphenol 9 polycarbonate, or mixtures thereof possess reduced melt viscosity characteristic of the effect of addition of low-molecular-weight additives while maintaining mechanical properties characteristic of polymer addition. These compositions can be extruded and injection molded at temperatures unexpectedly lower than is characteristic of either type of bicomponent system to give extruded sheet and films, photographic base film, foamed articles, and blow-molded bottles having good mechanical properties.

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3,819,760

## PROCESS FOR PREPARATION OF UNSATURATED POLYESTER

Yuzo Aito, Tokyo, Takeshi Fujii, Noritsugu Saiki, and Shuji Irie, Iwakuni, and Yasukuni Nakatsuji, Sagamihara, Japan, assignors to Teijin Limited, Osaka, Japan

No Drawing. Filed July 13, 1972, Ser. No. 271,408
Int. Cl. C08f *21/02*
U.S. Cl. 260—861 10 Claims

Improved process for producing an unsaturated polyester which comprises reacting a polyhydric alcohol component composed of not more than 50 mol percent of a compound selected from the group consisting of propylene glycol, propylene oxide, diethylene glycol and dipropylene glycol and 50 to 100 mol percent of ethylene oxide and/or ethylene glycol with a dicarboxylic acid component composed of 90 to 20 mol percent of an unsaturated aliphatic dicarboxylic acid or its acid anhydride and 10 to 80 mol percent of a methyl-substituted benzenedicarboxylic acid which may contain up to 20 mol percent of another saturated dicarboxylic acid, the amounts of said ethylene glycol and/or ethylene oxide and said methyl-substituted benzenedicarboxylic acid being defined by the following formula

$$3/7(x-30) \leqq y$$

wherein $x$ is the mol percent of the ethylene glycol and/or ethylene oxide in said polyhydric alcohol component, and $y$ is the mol percent of the methyl-substituted benzenedicarboxylic acid in said dicarboxylic acid component.

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3,819,761

## HIGH IMPACT STRENGTH THERMOPLASTIC COMPOSITIONS

Gim F. Lee, Jr., Albany, N.Y., assignor to General Electric Company

No Drawing. Filed Sept. 24, 1971, Ser. No. 183,630
Int. Cl. C08c *9/14*; C08d *9/08*

There are provided high impact strength thermoplastic compositions comprising a polyphenylene ether and a rubber modified polystyrene resin, the polystyrene matrix in the composition having an intrinsic viscosity of at least 1.0 deciliters/gram. Such compositions, which contain polystyrene of substantially higher molecular weight than heretofore, provide molded articles with unexpected improvements in impact resistance, surface appearance and resistance to aggressive solvent systems. Also provided are high impact compositions, useful *per se* or for blending with polyphenylene ethers, comprising polyblends of rubber dispersed in a polystyrene matrix, the polystyrene having an intrinsic viscosity of at least 1.0 deciliters/gram.

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3,819,762

## POLYMERS OF ACRYLONITRILE AND AROMATIC OLEFINS WHICH OPTIONALLY CONTAIN GRAFTED RUBBER

King Lau Howe, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Nov. 17, 1971, Ser. No. 199,766
Int. Cl. C08f *19/18*
U.S. Cl. 260—876 R 16 Claims

A composition consisting essentially of (A) 65 to 100 percent by weight of a polymer consisting essentially of 76 to 85 percent by weight acrylonitrile polymerized units and 24 to 15 percent by weight polymerized units of at least one aromatic olefin containing 8 to 14 carbon atoms, said polymer having a melt viscosity of $10^4$ to $10^6$ poises at 220° C. and an inherent viscosity of from 0.3 to 1.0 deciliter per gram and (B) 0 to 35 percent by weight of grafted rubber, said grafted rubber consisting essentially of 30 to 50 percent by weight of a graft polymer consisting essentially of 76 to 85 percent by weight acrylonitrile polymerized units and 24 to 15 percent by weight polymerized units of at least one aromatic olefin containing 8 to 14 carbon atoms, and 50 to 70 percent by weight rubber; said composition having a carbon dioxide permeability of less than 0.045 barrer; and shaped articles made therefrom.

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3,819,763

## IMPACT RESISTANT RESINOUS COMPOSITIONS CONTAINING ACRYLONITRILE-CHLORINATED POLYETHYLENE-STYRENE RESIN OR METHYL METHACRYLATE-CHLORINATED POLYETHYLENE-STYRENE RESIN AND AN ELASTOMER

Junta Akane, Tokyo, Takanori Saito, Kawasaki, and Tetsuo Yasuda, Ashigara, Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan

No Drawing. Filed June 30, 1972, Ser. No. 267,982
Claims priority, application Japan, Oct. 4, 1971, 46/77,070
Int. Cl. C08f *41/12*
U.S. Cl. 260—876 R 9 Claims

A thermoplastic resinous molding composition of improved impact strength which comprises an intimate mixture of:

(a) 100 parts by weight of either an acrylonitrile-chlorinated polyethylene-styrene type resin or a methyl methacrylate-chlorinated polyethylene-styrene type resin,

(b) 2–20 parts by weight of an elastomer not having an unsaturated bond in its main chain, and optionally,

(c) Up to 100 parts by weight of either a polymeric or copolymeric resin of vinyl chloride.

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3,819,764

## PROCESS FOR THE GRAFTING OF STYRENE ONTO POLYMERIC BUTADIENE OR ISOPRENE PREREACTED WITH AN ALKYL LITHIUM OR SODIUM AND A SEC-ALKYL CHLORIDE

Adel F. Halasa, Bath, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

No Drawing. Filed May 30, 1972, Ser. No. 258,039
Int. Cl. C08f *19/08*
U.S. Cl. 260—877 14 Claims

The process described herein involves a method of grafting styrene, etc. onto a polymer of butadiene or iso-

prene, after the polymer has been pretreated with an alkyl lithium or sodium in the presence of a secondary alkyl chloride to prevent the formation of styrene homopolymer or large blocks of polystyrene which are otherwise formed.

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**3,819,765**

**GRAFT COPOLYMERIZATION OF ALPHA-MONOOLEFIN COPOLYMER RUBBERS TO MAKE GUM PLASTICS**

**Francis X. O'Shea, Nagatuck, Conn., assignor to Uniroyal, Inc., New York, N.Y.**

**Original application Dec. 30, 1968, Ser. No. 787,984, now Patent No. 3,642,950. Divided and this application July 21, 1971, Ser. No. 164,542**

**The portion of the term of the patent subsequent to Mar. 21, 1989, has been disclaimed**

**Int. Cl. C08f** *15/04*

**U.S. Cl. 260—878 R** **1 Claim**

A two-stage method of grafting on EPM or EPDM rubber to make a tough, impact-resistant gum plastic:

(I) A portion only of resin forming monomer (e.g., styrene, acrylonitrile) is first "pregrafted" in solution on the EPM or EPDM rubber spine;

(II) The remaining amount of resin-forming monomer is combined with the lightly grafted rubber, and subjected to further graft polymerization to produce the final gum plastic.

New graft copolymers of resin-forming monomers on ethylene/propylene/5-ethylidene-2 - norbornene terpolymer rubber are also disclosed.

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**3,819,766**

**PROCESS FOR PREPARING THERMOPLASTIC ELASTOMER**

**Yasuo Hata and Yasusuke Shuto, Chibaken, Japan, assignors to Idemitsu Kosan Co., Ltd., Tokyo, Japan**

**No Drawing. Filed Sept. 10, 1971, Ser. No. 179,590**

**Int. Cl. C08d** *15/18, 15/22, 15/04, 19/08*

**U.S. Cl. 260—879** **1 Claim**

A thermoplastic elastomer is prepared by heating block copolymers comprising styrene, acrylonitrile or their derivatives as a thermoplastic component, and butadiene, isoprene, phenyl butadiene or their derivatives as an elastomer component in the presence of a cross-linking agent such as benzoyl peroxide, if necessary, at a temperature of 70° to 130° C. for 2 to 24 hours. The thermoplastic elastomer has a rubber elasticity and can be readily injection molded, and is very useful as engineering materials for shock absorbers and mechanical parts.

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**3,819,767**

**PROCESS FOR PRODUCING BLOCK COPOLYMER**

**Takatoshi Shimomura, Toyonaka, Hideo Nagata and Yoshiaki Murakami, Ibaragi, and Haruyoshi Sanno and Tadanori Inoue, Takatsuki, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan**

**No Drawing. Filed Aug. 28, 1972, Ser. No. 283,954**

**Claims priority, application Japan, Aug. 31, 1971, 46/67,308**

**Int. Cl. C08f** *19/06, 19/08*

**U.S. Cl. 260—880 B** **15 Claims**

A self-curing block copolymer, which has improved elastomeric properties without being subjected to any special chemical or physical treatment, is obtained by anionically polymerizing a vinyl-substituted aromatic hydrocarbon in the presence of an organo monolithium compound as catalyst, and after substantial commencement of polymerization of the vinyl-substituted aromatic hydrocarbon, copolymerizing a conjugated diene in the presence of the vinyl-substituted aromatic hydrocarbon, and after substantial completion of polymerization of the conjugated diene, adding a chelating bi- or tri-functional Lewis base to continue the polymerization of the vinyl-substituted aromatic hydrocarbon. The block copolymer thus obtained has a high tensile strength and high elongation in the unvulcanized state and can be processed similarly to a thermoplastic resin by injection and extrusion techniques.

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**3,819,768**

**GOLF BALL COVER COMPOSITIONS COMPRISING A MIXTURE OF IONOMER RESINS**

**Robert P. Molitor, South Hadley, Mass., assignor to Questor Corp.**

**No Drawing. Filed Feb. 11, 1972, Ser. No. 225,663**

**Int. Cl. C08f** *37/18*

**U.S. Cl. 260—897 B** **8 Claims**

The subject application relates to golf balls having cover compositions which result in balls having superior cold cracking properties, superior coefficients of restitution, superior durability and better aging characteristics. The cover compositions of the subject invention can be utilized in conjunction with golf balls which have solid or wound cores. The golf ball cover compositions of the subject invention generally comprise mixtures of ionic copolymers of olefins and unsaturated monocarboxylic acid salts, such as a mixture of sodium and zinc salts of said copolymers.

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**3,819,769**

**SPLIT FIBERS FROM BLENDS OF POLYPROPYLENE AND POLYETHYLENE**

**Ernst Pirot, Wuppertal, Germany, assignor to J. P. Bemberg Aktiengesellschaft, Wuppertal-Oberbarmen, Germany**

**No Drawing. Original application Dec. 26, 1968, Ser. No. 787,211, now Patent No. 3,624,194. Divided and this application June 21, 1971, Ser. No. 154,191**

**Claims priority, application Germany, Jan. 3, 1968, P 17 10 608.0**

**Int. Cl. C08f** *29/12*

**U.S. Cl. 260—897 A** **4 Claims**

Spit fibers exhibiting the reticular structure obtained by mechanical reduction of an extruded and stretched polymer film strip, the polymer consisting essentially of a mixture of polypropylene having more than 5% atactic content with a low-pressure polyethylene. The resulting split fibers are generally useful as continuous threads, yarns and the like or as staple fibers.

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**3,819,770**

**FIRE RETARDANT THERMOPLASTIC POLYMER COMPOSITIONS**

**Paul Kraft, Spring Valley, and Siegfried Altscher, Monsey, N.Y., assignors to Stauffer Chemical Company, Westport, Conn.**

**No Drawing. Original application June 23, 1970, Ser. No. 49,204, now Patent No. 3,725,509. Divided and this application Nov. 22, 1972, Ser. No. 308,881**

**Int. Cl. C08f** *29/20, 45/58*

**U.S. Cl. 260—898** **6 Claims**

Self-extinguishing, thermoplastic polymer compositions are prepared by the intimate admixture of a thermoplastic polymer with a copolymer of a halogen containing ethylenically unsaturated monomer and a phosphorus containing vinyl monomer, particularly a bis(hydrocarbyl) vinylphosphonate. The thus modified thermoplastic polymers display a high degree of flame retardance without any substantial changes in their physical properties including, for example, their clarity and hardness and the resulting compositions may be safely employed in any application requiring their possible exposure to fire or high temperatures.

3,819,771
**POLYMERIC PHOSPHITE POLYOLS**
Wadim Batorewicz, 1523 Chapel St., New Haven, Conn. 05511
No Drawing. Continuation-in-part of abandoned application Ser. No. 169,054, Aug. 4, 1971. This application May 8, 1972, Ser. No. 251,724
Int. Cl. C07f 9/08
U.S. Cl. 260—921 13 Claims

Certain hydroxylic pentaerythritol phosphites containing 15–20% of phosphorus are polymerized by heating them until the viscosity at 25° C. has reached at least 20,000 centipoises. The resulting amorphous compositions comprising polymeric organo-phosphite polyols are suitable for interaction with polyisocyanates in the production of polyurethanes in which the phosphites become a substantive part of the polymers. Polyurethane foams so made have superior flame-retardant properties compared with those of other phosphorus-containing polyurethanes. The polymeric phosphite polyols are also useful as flame-retardants in polyester and polyvinyl chloride compositions.

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3,819,772
**METHOD OF MAKING THIN DEFECT-FREE SILICONE RUBBER FILMS AND MEMBRANES**
Theodor Kolobow, Rockville, Md., assignor to the United States of America as represented by the Secretary, Department of Health, Education, and Welfare
No Drawing. Filed Feb. 23, 1973, Ser. No. 335,155
Int. Cl. A62b 7/00
U.S. Cl. 264—22 10 Claims

A method of making thin defect-free silicone rubber films and membranes which comprises forming a dispersion of a silicone rubber stock compounded with reinforcing filler material, centrifuging the dispersion so as to remove therefrom undispersed filler aggregates, casting a film of the centrifuged dispersion onto a releasable carrier substrate, evaporating the solvent from the film, and curing the film. The film may thereafter be subjected to a post-cure with ultraviolet radiation which significantly increases its tensile strength and burst strength and decreases its elongation.

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3,819,773
**METHOD FOR PREPARING RECLAIMABLE COATED POLYESTER FILMS**
Gordon Edmund Alfred Pears, Harpenden, England, assignor to Imperial Chemical Industries Limited, London, England
No Drawing. Continuation-in-part of abandoned application Ser. No. 52,763, July 6, 1970. This application Aug. 21, 1972, Ser. No. 282,054
Claims priority, application Great Britain, July 15, 1969, 35,556/69
Int. Cl. B29c 29/00; B29d 7/24; B32b 27/36
U.S. Cl. 264—37 7 Claims

Coating extruded polyester films with a reclaimable thermosetting acrylic or methacrylic composition before or during the orientation stretching steps and refeeding the coated film with fresh polyester to the film forming extruder.

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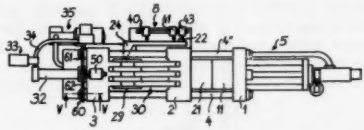
3,819,774
**METHOD FOR CONTROLLING OPERATION OF A PRESS**
Ulrich Eggenberger, Oberuzwil, and Josef Zehnder, Niederuzwil, Switzerland, assignors to Gebruder Buhler AG, St. Gall, Switzerland
Original application May 5, 1969, Ser. No. 821,822, now Patent No. 3,642,405. Divided and this application Feb. 22, 1971, Ser. No. 117,825
Claims priority, application Switzerland, May 9, 1968, 6,956/68
Int. Cl. B29c 3/06
U.S. Cl. 264—40 6 Claims

A method for controlling the operation of a press of the type including at least two mold parts arranged to be closed to define a mold cavity and opened relative to each other, relatively movable carrier plates each mounting a mold part, a toggle mechanism operable by a driving motor to displace one carrier plate relative to a stationary carrier plate, a joint plate engaged with toggle mechanism, beams extending between the stationary carrier plate and the joint plate, the beams constituting tension members interconnecting the stationary carrier plate and the joint plate, and a shifting mechanism for adjusting the effective



length of the beams between the stationary carrier plate and the joint plate. The method of operating the press comprises setting a range of available driving power between minimum and maximum values, and during each cycle of operation measuring the peak driving power, comparing the measured power to the range of available power and responsive to the deviation of the measured power to the range of available power effecting or shifting of the beam length to restore the measured power to the range of available driving power.

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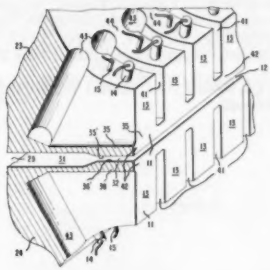
3,819,775
**METHOD OF MAKING POLYMERIC FILM**
Richard D. Mules, 4 Wheeler Court, Darley Woods, Wilmington, Del. 19810
Filed Aug. 15, 1972, Ser. No. 280,890
Int. Cl. B29f 3/08
U.S. Cl. 264—40 3 Claims



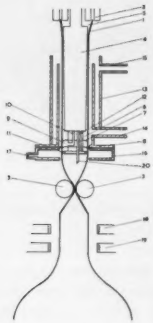
An apparatus is provided for making polymeric film wherein flowable polymeric material is extruded in molten form through an extrusion die orifice in the form of a web of film and which apparatus includes means for selectively controlling (by heating or cooling) the temperature of isolated parts of the die lips defining the die orifice whereby to improve thickness uniformity of the film. A method also is provided of making this polymeric film of improved thickness uniformity.

3,819,776

## PROCESS AND APPARATUS FOR THE PRODUCTION OF TUBES AND TUBULAR FILMS

William Robinson, Islesteps, John Brian Davis, Dumfries, and Derek Skilling, Heathhall, Scotland, assignors to Imperial Chemical Industries Limited, Millbank, London, England

Filed Mar. 1, 1971, Ser. No. 119,612
Claims priority, application Great Britain, Mar. 3, 1970, 10,139/70
Int. Cl. B29c *25/00;* B29d *23/04*
U.S. Cl. 264—40 16 Claims



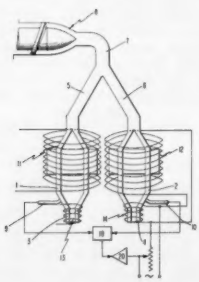
A cooling system for quenching extruded tubing consisting of a cooling mandrel, a seal within the tube beyond the end of the mandrel and a film of liquid maintained between the mandrel and the extruded tube which flows to fill the space between the seal and the mandrel wherein the pressure of the liquid between the tube and the mandrel is controlled to be greater than the pressure on the outside of the tube at any one position.

3,819,777

## METHOD FOR REGULATING THE MULTIPLE HEAD EXTRUSION OF PLASTIC MATERIALS

Leon Vermeerbergen, Lagnieu, France, assignor to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed May 27, 1971, Ser. No. 147,479
Claims priority, application France, May 29, 1970, 7019808
Int. Cl. B29d *23/04;* B29f *3/08;* G01l *7/00*
U.S. Cl. 264—40 4 Claims



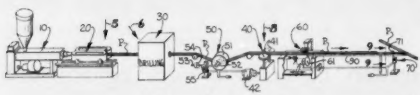
Multiple head extrusion apparatus is provided in which the output of all heads is equated to the output of a master head by control of viscosity, the difference in pressure between the master head and the controlled head being used continuously to control a temperature control means which is associated with the controlled head. The temperature control is conveniently by pneumatic cooling and electrical heating of the head, either or both of which can be operated by the difference in pressure.

3,819,778

## METHOD OF MAKING AND PROCESSING CORRUGATED PLASTIC PIPE

Ernest J. Maroschak, Roseboro, N.C., assignor to Plastic Tubing, Inc., Roseboro, N.C.

Filed June 13, 1972, Ser. No. 262,192
Int. Cl. B29c *17/07, 17/10, 17/15*
U.S. Cl. 264—40 12 Claims



A method of making plastic corrugated pipe which includes the steps of extruding a hot plastic material into a blow molding zone defined by a series of cooperating pairs of moving die blocks to form a pipe having annular corrugations of alternating ribs and valleys thereon during forward movement of the pipe through the blow molding zone, delivering the corrugated pipe from the blow molding zone at a predetermined speed, feeding the corrugated pipe delivered from the blow molding zone successively through drilling and cutting stations by meshingly engaging corrugations of the pipe with a plurality of forwardly moving teeth with successive teeth entering successive valleys and pushing forwardly against the successive ribs of the corrugated pipe, drilling holes in the pipe as it passes through the drilling station, cutting the drilled pipe into predetermined lengths as it passes through the cutting station, and sensing variations in tension in the corrugated pipe being fed and in response thereto varying the rate of movement of the forwardly moving teeth to compensatively vary the rate of feed of the pipe to substantially accord with the rate of delivery of the pipe from the blow molding zone to avoid undesirable stretching or longitudinal compression of the pipe and to thereby obtain a pipe with a substantially uniform number of ribs and valley portions per unit of length thereof.

3,819,779

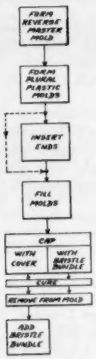
## PAINT BRUSHES AND HANDLES PREPARED FROM INTEGRAL-SKIN POLYURETHANE FOAM

John A. Pharris and Erik Henningsen, both % EZ Paintr Corporation, 4051 S. Iowa Ave., Milwaukee, Wis. 53207

Filed July 19, 1971, Ser. No. 163,623
Int. Cl. B29d *27/00*
U.S. Cl. 264—45 7 Claims

A plastic molded paint brush handle having a bristle bundle receiving end, a base adjacent thereto tapering upwardly from opposite sides to merge into a slightly tapering elongated handle portion to a tip that is slightly narrower than a neck portion defined by the point of merger of the base and handle portion. The handle is preferably formed of a foamed polyurethane having a density approximating that of wood and characterized by a substantially paint impervious brittle skin on its exterior. The in-

vention also contemplates an inexpensive method of forming the same wherein a plurality of polyethylene molds




are used for molding the handles and are formed from a single reverse master mold.

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**3,819,780**

## INJECTION MOLDING OF NYLON FOAM PANELS

**Norman Stewart Anderson, Hexagon House, Blackley, Manchester, England**

**No Drawing. Original application Jan. 5, 1971, Ser. No. 104,161, now Patent No. 3,702,280. Divided and this application Aug. 21, 1972, Ser. No. 282,059**

**Int. Cl. B29d** *27/00*

**U.S. Cl. 264—45** **7 Claims**

Process for the manufacture of a nylon panel wherein a nylon material is injected into an adjustable thickness panel mould and then a foamable nylon material containing as blowing agent, an oxalic acid derivative, is injected before the first nylon material has solidified so that the mould cavity is filled without foaming and then the thickness of the mould cavity is increased to allow the foamable composition to foam.

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**3,819,781**

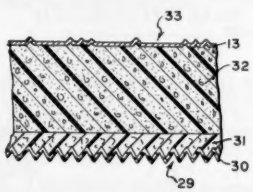
## TEXTURED SURFACE, CELLULAR CORE SHEET MATERIAL

**Andrew T. Kornylak, Hamilton, Ohio, assignor to Kornylak Corporation, Hamilton, Ohio**

**Filed Mar. 8, 1972, Ser. No. 232,729**

**Int. Cl. B29c** *5/08, 5/10*

**U.S. Cl. 264—46** **10 Claims**




Rigid sheet material for building purposes is constructed with a cellular core, preferably of rigid urethane foam, and at least one surface textured with a desired three dimensional pattern by forcing the surface material into a correspondingly shaped mold surface by the expansion of the foam material during formation of the foam core, with subsequent curing. Preferably, a continuous system employs opposed slat belt conveyors that form generally parallel rigid support surfaces moving in a common direction to back up at least one embossed or textured belt that forms the mold surface. A relatively thin gel coat, a prefabricated gel coat, a homogeneous gel sheet, or an easily deformed sheet material may be in direct contact with the textured belt to be forced into the mold cavities of the textured belt under the relatively high pressures of approximately 5 p.s.i. produced by the foaming of the core material. The thus embossed skin material and foamed core material are cured within the confined space of the opposed conveyors to form a rigid self-sustaining structure. Further, the core material may be of the self-skinning type to form a homogeneous textured surface. The thus continuously produced sheet material is side trimmed, cut into convenient lengths, and stacked for facilitating removal.

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**3,819,782**

## PROCESS FOR PRODUCING A LIGHT-CONDUCTING STRUCTURE

**Masanori Irie, Amagasaki, Japan, assignor to Nippon Selfoc Kabushiki Kaisha, Tokyo-to, Japan**

**Original application Sept. 17, 1969, Ser. No. 858,866, now abandoned. Divided and this application Aug. 6, 1971, Ser. No. 169,874**

**Int. Cl. B29d** *27/00*

**U.S. Cl. 264—49** **10 Claims**

Light-conducting structures each having a gradual refractive index gradient in a direction transverse to the direction in which light is to advance in the structure, which structure is made of a transparent mixture of at least two synthetic polymers having different refractive indexes, the proportions of the polymers in the mixture being such that they vary progressively in a direction transverse to the direction in which light is to advance thereby to create the refractive index gradient. This variation in the mixture of at least two polymers is produced by selective extraction of the mixture by a solvent in which one polymer in the mixture is soluble but the other polymer is less soluble.

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**3,819,783**

## PROCESS FOR EMBOSSING A THERMOPLASTIC LAYER BY SELECTIVE EXPANSION

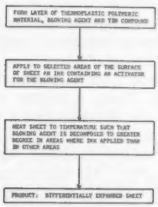
**Peter William Jones, Loughborough, England, assignor to Fisons Limited, London, England**

**Filed June 8, 1971, Ser. No. 151,137**

**Claims priority, application Great Britain, June 11, 1970, 28,434/70**

**Int. Cl. B29d** *7/22, 27/04;* **B41m** *7/00*

**U.S. Cl. 264—52** **6 Claims**


FORM LAYER OF THERMOPLASTIC POLYMERIC MATERIAL, BLOWING AGENT AND TIN COMPOUND
APPLY TO SELECTED AREAS OF THE SURFACE OF SHEET AN INK CONTAINING AN ACTIVATOR FOR THE BLOWING AGENT
HEAT SHEET TO TEMPERATURE SUCH THAT BLOWING AGENT IS DECOMPOSED TO GREATER DEGREE IN AREAS WHERE INK APPLIED THAN IN OTHER AREAS
PRODUCT: DIFFERENTIALLY EXPANDED SHEET

Materials having an embossed surface are formed by printing a layer containing a thermoplastic polymer, a blowing agent and a tin compound, with a printing ink containing an activator for the blowing agent, and heating the layer to cause the blowing agent in the printed areas to decompose to a greater degree than the blowing agent in the unprinted areas.

3,819,784
**PROCESS FOR PREPARING MOLDED POLYOLEFIN FOAM**
Yoshifumi Hasama and Ryoichi Ito, Yokkaichi, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Chiyoda-ku, Tokyo, Japan
Filed Sept. 24, 1971, Ser. No. 183,617
Claims priority, application Japan, Oct. 7, 1970, 45/87,483
Int. Cl. B29d *27/00;* B29h *7/20*
U.S. Cl. 264—54 3 Claims

A process for preparing a molded polyolefin foam which comprises extruding a mixture of polyolefin, a first chemical blowing agent and a second blowing agent, said second blowing agent being capable of effecting foaming at a lower temperature than the decomposition temperature of the first chemical blowing agent, activating said second blowing agent so as to form preliminary foamed particles of polyolefin containing said first chemical blowing agent, and having a density of greater than 0.35 g./cc., introducing said preliminary foamed particles into a mold and externally heating said mold at a temperature higher than the decomposition temperature of said first chemical blowing agent, whereby the surface of the molded polyolefin foam is melted to provide a skin layer.

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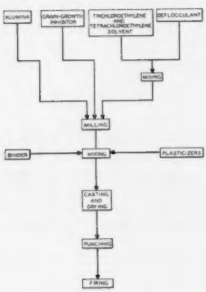
3,819,785
**FINE-GRAIN ALUMINA BODIES**
John F. Argyle, Bethlehem, and Glenn O. Medowski, David W. Ports, and Richard D. Sutch, Allentown, Pa.; said Medowski, Ports and Sutch assignors to Western Electric Company, Incorporated, New York, N.Y., said Argyle assignor to Bell Telephone Laboratories, Incorporated, Berkeley Heights, N.J.
Filed Feb. 2, 1972, Ser. No. 222,974
Int. Cl. B28b *1/26;* C04b *35/64*
U.S. Cl. 264—63 5 Claims




A casting slip for fine-grain alumina bodies includes alumina, a grain-growth inhibitor such as magnesia, a solvent including trichloroethylene and tetrachloroethylene, and a deflocculant such as menhaden oil. These ingredients are milled. Then, a binder such as polyvinyl butyral resin with a low viscosity and a low hydroxy content and plasticizers such as polyalkylene glycol and phthalate ester are added to these ingredients and the entire slip is mixed. Next, the slip is cast onto a moving carrier sheet into the form of a tape which is dried, punched and fired to form fine-grain alumina bodies which are particularly useful as subtrates for microcircuits, including thin film and integrated circuits. The slip is nonflammable and vapors therefrom produce a nonexplosive mixture with air. Also, solvents of the tape do not excessively attack the sheet onto which it is cast and the cast tape is accordingly very flat. The tape is also very flexible and easy to roll up and store. The flat tape, when punched and fired, produces flat alumina bodies.

3,819,786
**PRODUCTION OF SILICON NITRIDE MATERIAL COMPONENTS**
Edwin Richard Wells May, Poole, England, assignor to National Research Development Corporation, London, England
No Drawing. Continuation of abandoned application Ser. No. 862,024, Sept. 29, 1969. This application Mar. 6, 1972, Ser. No. 232,220
Int. Cl. C04b *35/58*
U.S. Cl. 264—63 3 Claims

Silicon nitride components are formed by hot milling and then shaping a dough-like material comprising silicon powder and a suitable organic chemical binder consisting of from 35 to 40% butyl methacrylate and 60–65% trichloroethylene and subsequently subjecting the form to a nitriding treament.

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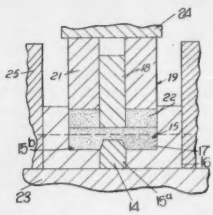
3,819,787
**METHOD OF PRODUCING A PAIR OF SILICON**
Roger Frank Coe, Birmingham, England, assignor to Joseph Lucas Industries Limited, Birmingham, England
Filed July 29, 1971, Ser. No. 167,160
Int. Cl. F27b *9/04*
U.S. Cl. 264—65 15 Claims




A method of producing a plurality of interconnected silicon nitride parts comprises the steps of starting with a first silicon nitride part, providing on said first part a mixture of silicon nitride, which is substantially in the α-phase, and up to 25% by weight of a fluxing agent, and hot pressing the mixture of silicon nitride and the fluxing agent onto the first part so as to produce a second, hot pressed silicon nitride part interconnected with the first part.

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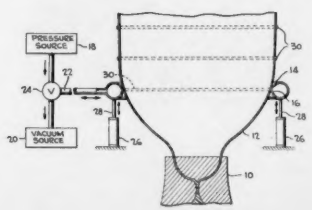
3,819,788
**EXTRUDED PLASTIC FILMS AND METHOD FOR FORMING THE SAME**
Pierre Grumbach, Sartrouville, France, assignor to La Cellophane, Paris, France
Filed Nov. 23, 1971, Ser. No. 201,289
Int. Cl. B29d *23/04, 23/18*
U.S. Cl. 264—89 5 Claims




A process is disclosed for preparing plastic film having spaced transverse ribs thereon wherein the plastic is ex-

truded in tubular shape, drawn into a hollow member by vacuum after extrusion while still hot or after reheating and moving the hollow member along with the tubular shape while fusing portions of the tubular film upon itself to give a circumferential rib then releasing the vacuum and moving the hollow member back in the opposite direction to position the member for a repeat of the operation.

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**3,819,789**

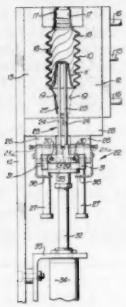
**METHOD AND APPARATUS FOR BLOW MOLDING AXIALLY DEFORMABLE CONTAINERS**

**Carol Parker, 355 H Ave., Coronado, Calif. 92118**

**Continuation-in-part of abandoned application Ser. No. 832,257, June 11, 1969. This application July 30, 1971, Ser. No. 167,715**

**Int. Cl. B29c** *17/07*

**U.S. Cl. 264—94** **8 Claims**



Apparatus for use in association with a mold used on a blow molding machine to produce a molded container with a bottom portion that includes a hollow expeller extending into the interior of the container. The apparatus includes an elongated forming rod. The forming rod is sectioned to separate with the mold halves and that functions to cut off the parison and form the bottom of the container. An actuator then causes the forming rod to force the bottom portion into the container inverting it and forming the expeller.

The method of forming the container includes the timing of the inversion of the expeller to take place after the blowing, and release of blowing pressure, but prior to the firming of the molded material.

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**3,819,790**

**MULTI-STEP AIR RING FOR TUBULAR FILM PROCESS**

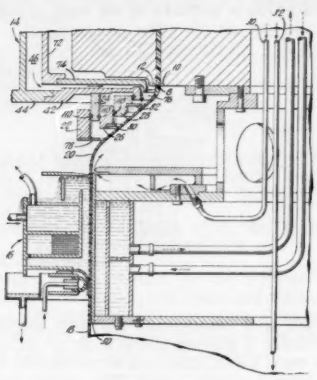
**Howard C. North, Westfield, and Gene C. Calderwood, Basking Ridge, N.J., and Charles W. Williamson, Seabrook, Tex., assignors to Esso Research and Engineering Company**

**Continuation of abandoned application Ser. No. 887,270, Dec. 22, 1969. This application May 8, 1972, Ser. No. 251,504**

**Int. Cl. B29d** *23/04*

**U.S. Cl. 264—89** **7 Claims**

In the extrusion of a thermoplastic resin through a ring die to form a tubular film wherein the film is partially cooled by means of a cooling gas before the tube is drawn over a cooling mandrel, the improvement of using multi-stepped adjustable rings to direct the cooling gas onto the external surface of the film between the die-gap and the mandrel, thus defining a series of orifices between the



rings and the film to effect a gradient in pressure from the die to the mandrel.

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**3,819,791**

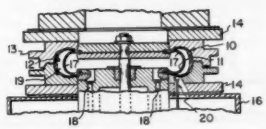
**METHOD FOR SINGLE STAGE CURING OF INTEGRATED DUAL CHAMBERED SAFETY TIRES**

**Myron T. Ayers, Akron, Ohio, assignor to The General Tire & Rubber Company**

**Filed Sept. 25, 1972, Ser. No. 292,207**

**Int. Cl. B29h** *5/02, 15/02*

**U.S. Cl. 264—94** **6 Claims**



Method for the single stage curing of integrated dual chamber safety tires. A tire is placed in a mold and the outer chamber of the tire is pressurized with a curing fluid at a pressure of from about 1 to 10 p.s.i. less than the pressure within a bladder inflated within the inner chamber. The tire is expanded against the mold and cured therein.

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**3,819,792**

**PROCESS FOR PRODUCING A THERMOPLASTIC SHAPED ARTICLE HAVING A DOUBLE LAYERED WALL**

**Katsuya Ono, Gifu, and Motozo Fujiwara, Yoshinari Tabe, and Norihiko Kawahito, Nagoya, Japan, assignors to Toray Industries, Inc., Tokyo, Japan**

**Filed July 20, 1971, Ser. No. 164,241**

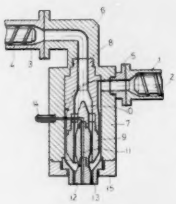
**Claims priority, application Japan, July 21, 1970, 45/63,684; Dec. 15, 1970, 45/111,095; Dec. 16, 1970, 45/125,329**

**Int. Cl. B29c** *17/07;* **B29d** *23/04;* **B29f** *3/12*

**U.S. Cl. 264—95** **7 Claims**

A thermoplastic resin shaped article having a double layered wall structure is provided wherein both layers are strongly bonded to each other. One layer thereof com-

prises a mixture of (a) 30 to 95% by weight of C–2 or –3 olefin homopolymer or copolymer or a blend thereof and (b) 70 to 5% by weight of an ethylene copolymer containing 0.1 to 10% by mole of a zinc salt of methacrylic acid, and the other layer comprises polyamide. The shaped article is prepared by the steps of separately



melting both layer components and then, joining both the melts under a pressure inside a die of an extruder before the melts are solidified and extruding said melts as a double layered tubular article. The shaped article has an improved resistance to the transmission of various chemicals, gasoline, water vapour, etc.

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**3,819,793**

**METHOD AND APPARATUS FOR CASTING THERMOPLASTIC MATERIALS, E.G. SULPHUR AND BITUMENS**

**Herbert James Elliott, "The Bungalow," Budbury, Bradford-on-Avon, England**

**Filed Apr. 8, 1971, Ser. No. 132,528**

**Claims priority, application Great Britain, Apr. 10, 1970, 17,156/70; Feb. 8, 1971, 4,115/71**

**Int. Cl. B29d** *7/02*

**U.S. Cl. 264—213** **8 Claims**

Method and apparatus are provided for casting thermoplastic materials, e.g. sulphur and bitumens. Thermoplastic material in molten condition is deposited onto a receiving surface which is maintained sufficiently moistened to prevent adhesion thereto but at the same time avoiding such a concentration of water which would result in occlusion in the solidified material. Examples of suitable receiving surfaces are wetted adsorbent surfaces such as unglazed ceramics, paper, soft woods and fabrics, textured and finely apertured surfaces e.g. wire mesh, and expanded plastics materials, including expanded regenerated cellulose materials.

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**3,819,794**

**METHOD FOR MAKING PRESTRESSED PRECAST CONCRETE ELEMENTS**

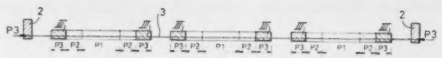
**Zeev Kidron, 20 Simtat Iris, Ramat-Hasharon, Israel**

**Filed May 15, 1972, Ser. No. 253,208**

**Int. Cl. B28b** *23/04*

**U.S. Cl. 264—228** **6 Claims**

Process for the production of prestressed precast concrete elements comprises tensioning high-tensile steel tendons to a predetermined degree of elongation, casting a section of concrete of predetermined length along a certain section of the tendon, allowing this to harden, decreasing the tensioning of the tendon by a predetermined




decrement, casting a further section of concrete in continuation of one or both sides of the first cast section, and if desired, repeating this process of further decreasing of tensioning and casting further sections.

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**3,819,795**

**PROCESS FOR MOLDING PLASTIC-COVERED GOLF BALLS**

**Frank S. Martin, Cranston, and James F. Little, Greenville, R.I., assignors to Uniroyal, Inc., New York, N.Y.**

**No Drawing. Filed Dec. 29, 1971, Ser. No. 213,495**

**Int. Cl. B29d** *3/00*

**U.S. Cl. 264—248** **13 Claims**

A method of making a golf ball wherein thermoplastic material is heated and formed into first and second hemipossessing excellent impact resistance, resistance to cutthe first shell and the second shell is placed thereover so that two shells meet at the equator of said shells. The shells are then molded to form a golf ball.

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**3,819,796**

**METHOD OF FORMING FOAMED POLYOLEFIN CASTS ON A LIVING BODY**

**Joseph George Webster, Croydon, and William Henry Tuck, Kenton, England, assignors to Bakelite Xylonite Limited, London, England**

**Continuation-in-part of application Ser. No. 868,242, Oct. 21, 1969, now Patent No. 3,662,057, which is a continuation of abandoned application Ser. No. 731,253, May 22, 1968. This application May 8, 1972, Ser. No. 251,327**

**Claims priority, application Great Britain, May 25, 1967, 24,473/67**

**The portion of the term of the patent subsequent to May 9, 1989, has been disclaimed**

**Int. Cl. B29c** *23/00;* **B29d** *27/00*

**U.S. Cl. 264—321** **20 Claims**

A method of forming a cast for a portion of a living body comprises bringing a sheet of a foamed, at least partially cross-linked, thermoplastics material, such as polyethylene, to a temperature which plasticizes it and renders it pliable without destruction of its foamed, cellular character. The pliable themosplastics material can be

shaped directly onto a living body. After cooling the material can be shaped directly onto a living body. After cooling the material sets in the configuration of the body.

The technique can be used in the formation of orthopaedic supports.

The material may have a reinforcing member embedded within it.

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3,819,797

## CYCLIC LEACH-PRECIPITATION PROCESS FOR RECOVERING COPPER VALUES FROM BODIES OF ORE MATERIAL CONTAINING COPPER MINERALS

**Henry Rush Spedden and Emil Edward Malouf, Salt Lake City, Utah, assignors to Kennecott Copper Corporation, New York, N.Y.**

**No Drawing. Continuation of application Ser. No. 55,578, July 16, 1970, now Patent No. 3,661,563. This application Oct. 14, 1971, Ser. No. 189,335**

**The portion of the term of the patent subsequent to Jan. 1, 1989, has been disclaimed**

**Int. Cl. C22b** *15/08*

**U.S. Cl. 423—27** **6 Claims**

As part of a cyclic, leaching-precipitation process for copper values, a reductant, such as a reducing gas or reducing ions selected from the group consisting of sulfite ion and bisulfite ion, is injected into a body of copper-mineral-bearing material. The injection site or sites are removed from access of atmospheric air, and injection is carried out in the absence of oxygen to prevent autooxidation of the reducing agent. When injected in an area adjacent the emergence from such body of an applied acidic leach solution containing ferric ions and pregnant with copper values, in order to reduce ferric ions in such leach solution to ferrous ions so difficulty, e.g. useless consumption of metallic iron precipitant, in the copper recovery stage is avoided, such reductant also acts as a bactericide to eliminate both autotropic aerobic bacteria, which oxidize ferrous to ferric iron in presence of oxygen, and anaerobic hydrogenase-producing strains of bacteria, which reduce sulfates in the absence of oxygen and produce hydrogen sulfide that undesirably precipitates soluble copper into insoluble copper sulfide. If such an area in the body of material or if other areas therein have become, either naturally or from applied leaching practices, substantially impervious to the continued percolation of a leach solution therethrough, they are rendered highly pervious by the injection thereinto of such reductant. A concomitant effect of this treatment is the release of water, rich in copper values, that had been impound in mine waste dumps or other bodies of material previously subjected to leaching. The reducing ions may be conveniently injected as a sulfite or bisulfite solution. When the reductant is a reducing gas, such as sulfur dioxide or carbon monoxide, it is preferably injected directly into the material concerned.

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3,819,798

## OXIDATION OF METAL SULFIDE ORES WITH ORGANIC HYDROPEROXIDES

**Rudolph Rosenthal, Broomall, Pa., assignor to Atlantic Richfield Company, New York, N.Y.**

**No Drawing. Filed May 23, 1972, Ser. No. 256,000**

**Int. Cl. B01d** *11/00;* **C22b** *11/00*

**U.S. Cl. 423—41** **20 Claims**

Metal sulfides ores such as galena (lead sulfide) are oxidized to the salt and to free sulfur by contacting with an organic hydroperoxide in the pressence of a strong mineral acid, such as sulfuric acid and the metal salt is then the sulfate. The metal sulfate can be converted to the metal and sulfuric acid by known technology and the free sulfur is also recovered by conventional methods. The process is advantageous in being non-polluting since no sulfur dioxide is produced.

3,819,799

## CHROMIUM EXTRACTION

**Donald E. Matschke, Hinsdale, Alfred M. Tenny, Homewood, and Jack K. Gregersen, Hinsdale, Ill., assignors to Bauer Engineering, Inc., and Tenco Hydro/Aerosciences, Inc., both of Chicago, Ill., fractional part interest to each**

**Filed May 11, 1972, Ser. No. 252,210**

**Int. Cl. C01g** *37/12*

**U.S. Cl. 423—53** **5 Claims**

Organic soils are used to remove trivalent chromium values from solutions containing the same.

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3,819,800

## ALKALI METAL CHROMATE PRODUCTION

**Kenneth F. Shaffer and Irvin G. Arnold, Jr., Wilmington, N.C., assignors to Diamond Shamrock Corporation, Cleveland, Ohio**

**No Drawing. Filed Aug. 28, 1972, Ser. No. 284,042**

**Int. Cl. C01g** *37/14*

**U.S. Cl. 423—58** **6 Claims**

Chromite ore is roasted in the presence of small amounts of lime, slurried with water and the slurry acidified to a sufficient degree to precipitate alumina hydrate. When the slurry is subsequently filtered, the filtrate comprises a high purity alkali metal chromate.

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## ERRATUM

For Class 423—130 see:
Patent No. 3,819,337

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3,819,801

## PREFERENTIAL SULFIDING OF NICKEL AND COBALT OXIDES

**James Alexander E. Bell, Toronto, Ontario, and Vaclav Opratko and Daniel Kelly, Clarkson, Ontario, Canada, assignors to The International Nickel Company, Inc., New York, N.Y.**

**No Drawing. Filed Feb. 12, 1973, Ser. No. 331,767**

**Claims priority, application Canada, Apr. 17, 1972, 139,858**

**Int. Cl. C01g** *1/10, 1/12, 53/00*

**U.S. Cl. 423—138** **15 Claims**

Nickel values contained in oxide materials are selectively sulfided by heating an aqueous slurry containing the oxide material, dissolved chlorides and sulfur in a form capable of sulfiding nickel values to a temperature between about 200° C. and 240° C. under a hydrogen overpressure. Sea water can be employed in forming the aqueous slurry and, thus, act as a source of the dissolved chlorides.

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3,819,802

## PROCESS FOR TREATING WASTE SULFITE LIQUOR

**Murray Clinton Robinson, Don Mills, Ontario, Canada, assignor to Spring Chemicals Limited**

**No Drawing. Continuation of abandoned application Ser. No. 798,616, Feb. 12, 1969. This application Nov. 1, 1971, Ser. No. 194,478**

**Claims priority, application Canada, Feb. 12, 1968, 12,199**

**Int. Cl. D21c** *11/00*

**U.S. Cl. 423—158** **10 Claims**

The amount of calcium contained in waste sulfite liquor is reduced by precipitating the calcium as calcium sulfite and separating the precipitate from the remaining waste sulfite liquor solution. The precipitation is caused by dissolving a sulfite-ion-forming compound such as sulfur dioxide and a basic material such as ammonium hydroxide in the waste sulfite liquor. The sulfite-ion-forming compound is dissolved in the waste sulfite liquor in an amount greater than that needed to provide therein a substantially equimolar ratio of $SO_2$ to CaO. The amount of basic material dissolved is such that subsequent to the dissolution of the sulfite-ion-forming compound and the basic material the pH of the waste sulfite liquor is at least 5.0.

In addition, the basic material must be one which is capable of being dissolved in the waste sulfite liquor by the sulfite-ion-forming compound and must have a cation selected from the class consisting of magnesium, ammonium and sodium.

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## 3,819,803
## METHOD OF PREPARING MAGNESIUM HYDROXIDE

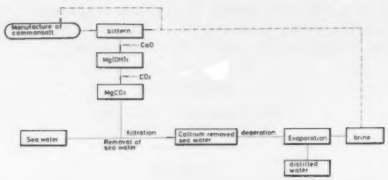
**Hisanobu Tabata and Norimasa Tabata, both of 968 Kou, Ohgoshi-machi, Sakaide-shi, Kagawa-ken, Japan, and Rokuro Nakajima, deceased, late of Sakaide-shi, Japan, by Tama Nakajima, heir, 1831 Ohyabucho, Sakaide-shi, Kagawa-ken, Japan**

**Original application June 15, 1970, Ser. No. 46,286, now Patent No. 3,676,067. Divided and this application Apr. 20, 1972, Ser. No. 245,777**

**Claims priority, application Japan, June 19, 1969, 44/48,416, 44/48,417**

**Int. Cl. C01f** *5/22*

**U.S. Cl. 423—160** **4 Claims**




Method of preparing magnesium hydroxide. An aqueous solution of magnesium chloride is reacted with particulate quicklime in a specified molar ratio in a closed rotated reaction zone. The pH of the reaction mass is maintained at a value of about 8 to 8.5 while the reaction is performed at a temperature of about 50–70° C. The aqueous magnesium chloride solution consists preferably of bittern obtained as the mother liquor in the preparation of common salt from sea water.

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## 3,819,804
## CONVERSION OF URANIUM HEXAFLUORIDE TO URANIUM DIOXIDE STRUCTURES OF CONTROLLED DENSITY AND GRAIN SIZE

**William R. De Hollander, San Jose, Calif., assignor to General Electric Company**

**Filed June 16, 1971, Ser. No. 153,749**

**The portion of the term of the patent subsequent to Jan. 15, 1991, has been disclaimed**

**Int. Cl. C01g** *43/02*

**U.S. Cl. 423—261** **23 Claims**

An integrated process for fabricating uranium dioxide structures of desired shape, density and grain size from enriched uranium hexafluoride is presented. Uranium hexafluoride is reacted with a reducing gas and an oxygen-containing carrier gas in a reduction-hydrolysis reaction in an active flame to yield a uranium dioxide rich powder of high surface area with fluoride impurities. The powder is separated from the gas stream after the reaction and is prepressed to a given shape by application of pressure and then broken into free flowing particles of a selected size range by granulation. Particles of powder outside the selected size range are screened out and can be combined with subsequent powder production for prepressing. The granulated powder is defluorinated by heating under a controlled atmosphere so that the high surface area of the powder is preserved. The defluorinated powder is then pressed into a structure of desired shape and sintered under a controlled atmosphere to yield a ceramic structure of desired density and grain size. The gas stream from the reaction of the uranium hexafluoride is treated to condense the hydrogen fluoride and water vapor as aqueous hydrofluoric acid. The process of this invention can be used with oxides of uranium of high surface area in any state of oxidation from uranium dioxide ($UO_2$) to uranium tritaoctoxide ($U_3O_8$) including uranium oxides produced by a post oxidation process converting the uranium dioxide rich powder to the higher oxide of uranium.

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## 3,819,805
## PROCESS FOR THE PREPARATION OF SODA ASH FROM TRONA ORE

**Charles A. Graves, New Woodstock, and Peter Sopchak, Liverpool, N.Y., assignors to Allied Chemical Corporation, New York, N.Y.**

**Filed Apr. 14, 1971, Ser. No. 133,996**

**Int. Cl. C01d** *7/12, 7/24*

**U.S. Cl. 423—206** **15 Claims**

A process for beneficiating trona ore for producing soda ash, which comprises crushing the ore, separating the ore by optical-mechanical sorting means, recovering the desired trona ore fraction and converting said beneficiated fraction to soda ash by calcination.

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## 3,819,806
## FACILITATED TRANSPORT OF HYDROGEN SULFIDE

**William J. Ward III and Robert M. Salemme, Schenectady, N.Y., and Jerome F. Mayer, Cambridge, Mass., assignors to General Electric Company**

**No Drawing. Filed Apr. 20, 1972, Ser. No. 245,893**

**Int. Cl. B01d** *53/34*

**U.S. Cl. 423—220** **3 Claims**

In an immobilized liquid membrane the transport of an acid gas, e.g. hydrogen sulfide, which is capable of dissolving in water and dissociating, is facilitated by the addition of water-soluble salt

$$[M_n{}^{+b}B_m{}^{-a} \text{ and/or } M_n{}^{+b}HB_m{}^{(1-a)}]$$

to the aqueous system, the anion of which reacts reversibly with $H^+$ as follows:

$$H^+M_n{}^{+b}B_m{}^{-a}=nM^{+b}+HB_m{}^{(1-a)}$$

where $nb=ma$. Salts providing any of $CO_3^=$, $HCO_3^-$ and $PO_4^{\equiv}$ are employed by way of example.

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## 3,819,807
## STABILIZED SODIUM DITHIONITE COMPOSITIONS

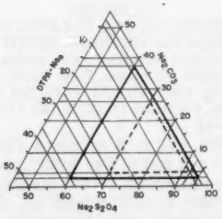
**Siegfried Schreiner and Siegmar Lukas, Ludwigshafen, and Franz Poschmann, Limburgerhof, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany**

**Filed Feb. 14, 1972, Ser. No. 226,021**

**Claims priority, application Germany, Feb. 19, 1971, P 21 07 959.4**

**Int. Cl. C01b** *17/66*

**U.S. Cl. 423—265** **2 Claims**




Stabilized sodium dithionite compositions which are not spontaneously flammable and contain sodium diethylene triaminopenta-acetate.

3,819,808

## PROCESS FOR PREPARING LITHIUM BOROHYDRIDE IN AN ETHER SOLUTION COMPRISING LITHIUM ALUMINUM HYDRIDE AND ALUMINUM HYDRIDE

Gerald H. Mattson, Midland, Mich., assignor to Pollution Control Products, Inc.

No Drawing. Filed Dec. 12, 1963, Ser. No. 330,199
Int. Cl. C01b *6/00, 6/14*
U.S. Cl. 423—286 3 Claims

The invention is to a method of reacting an ethereal solution of aluminum chloride with an ethereal solution of lithium aluminum hydride and sodium borohydride and recovering an ethereal solution of a product mixture comprising lithium borohydride, lithium aluminum hydride and aluminum hydride. Said product mixture can be used as a reagent in the preparation of high purity, hexagonal crystalline aluminum hydride.

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3,819,809

## NOVEL HALOPHOSPHAZINE COMPOUNDS

Sanford S. Jacobs, Iselin, N.J., assignor to M & T Chemicals Inc., Greenwich, Conn.

No Drawing. Filed Aug. 27, 1970, Ser. No. 67,596
Int. Cl. C01b *25/00, 21/00;* C09k *3/00*
U.S. Cl. 423—300 3 Claims

Novel compositions of the formula

$$[X(PNX_2)_{n-1}PX_3][MX_{v+1}]_m$$

wherein X is a halogen; *n* is a positive number and preferably 1–20; M is a metal ion having a valence *v*; and *v* is an integer 1–7 are prepared by reacting a phosphorus halide, an ammonium halide, a halogen and metal halide. The compositions are useful as damping fluids and as polymerization catalysts.

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3,819,810

## PHOSPHORIC ACID PURIFICATION

David Goldstein, East Brunswick, N.J., assignor to FMC Corporation, New York, N.Y.

Continuation-in-part of abandoned application Ser. No. 108,920, Jan. 22, 1971. This application June 19, 1972, Ser. No. 264,177
Int. Cl. C01b *25/16*
U.S. Cl. 423—321 4 Claims

Wet acid is freed of substantial magnesium impurities by contacting the acid with a soluble hexafluorosilicate ($SiF_6^{-2}$) thereby forming a precipitate of hydrated magnesium hexafluorosilicate ($MgSiF_6 \cdot 6H_2O$) which is then removed, leaving the purified acid.

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3,819,811

## PREPARATION OF SILICA GELS

Henri A. Aboutboul, Brussels, Belgium, Jerome H. Krekeler, Cincinnati, Ohio, and William Kirch, Clinton, Iowa, assignors to National Petro Chemicals Corporation, New York, N.Y.

Continuation-in-part of applications Ser. No. 750,733, now Patent No. 3,652,214, and Ser. No. 750,734, now Patent No. 3,652,215, both filed Aug. 6, 1968, Ser. No. 766,693, Oct. 11, 1968, now Patent No. 3,652,216, and Ser. No. 70,621, Aug. 14, 1970, now abandoned. This application Mar. 27, 1972, Ser. No. 238,313
The portion of the term of the patent subsequent to Mar. 28, 1989, has been disclaimed
Int. Cl. C01b *33/16*
U.S. Cl. 423—338 17 Claims

Silica xerogels having a narrow pore diameter distribution in the range of 300–600 A., surface areas in the range from 200 to 500 $m.^2/g.$, and pore volumes in the range of 2.0–3.5 $cm.^3/g.$ and a process for preparing such silica xerogels comprising critically controlled steps of precipitation of the silica gel, ageing the precipitated silica hydrogel slurry, washing the aged product, and removing the water from the gel with, where necessary, drying the gel. The water is removed in such a manner that the surface tension exerted upon the gel, during drying, is less than that surface tension which would result from the direct conversion of liquid water to water vapor. Typical techniques which may be employed are: (a) displacing the water in the gel with an organic liquid substantially completely miscible with water and then drying the gel; (b) vacuum freeze-drying the gel; or (c) adding a water-immiscible solvent, which forms an azeotrope with water when distilled, to the gel, distilling the azeotrope to remove substantially all of the water from the gel under a specific conditions and drying the gel from any remaining solvent.

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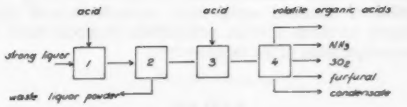
3,819,812

## PROCESS FOR THE RECOVERY OF $NH_3$, $SO_2$, VOLATILE ORGANIC ACIDS AND FURFURAL FROM CONCENTRATED WASTE LIQUOR

Matti Toivonen, Aanekoski, Jyrki Kettunen, Kirkniemi, and Eero Salunen, Kuopio, Finland, assignors to Savon Sellu Oy, Kuopio, Finland

Filed Apr. 12, 1971, Ser. No. 133,075
Claims priority, application Finland, Apr. 17, 1970, 915/70
Int. Cl. C01c *1/08;* C01b *17/48;* C07c *51/02*
U.S. Cl. 423—358 8 Claims




Ammonia, furfural, sulphur dioxide and volatile organic acids such as acetic and formic acids are recovered from ammonia based sulphite waste liquor by volatilizing them, drying the liquor to a powder, and separating them from the volatilized gases.

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3,819,813

## METHOD FOR PRODUCING AN ALKALI METAL CARBONATE

Irby C. Jones, Jr., and Walter E. Noack, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sept. 9, 1971, Ser. No. 179,087
Int. Cl. C01d *7/00*
U.S. Cl. 423—421 4 Claims

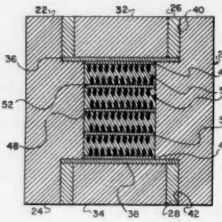
In one embodiment of the invention, an alkali metal carbonate is obtained by reacting a gas containing carbon dioxide, such as flue gas, with an aqueous solution containing an alkali metal hydroxide, such as sodium hydroxide. The carbonator apparatus comprises basically a horizontally-positioned enclosed elongate conduit which contains a packing material. The flue gas is directed into the carbonator unit and moved horizontally through the packing material. Simultaneously, the aqueous alkali solution is also moved horizontally through the carbonator unit and a portion of the liquid stream is continuously recirculated vertically downwardly through the packing material. The reaction of the flue gas with the aqueous alkali solution produces an alkali metal carbonate solution, a portion of which is continuously withdrawn at one end of the carbonator unit for recovery of the solid product.

3,819,814

## PLURAL MOLDED DIAMOND ARTICLES AND THEIR MANUFACTURE FROM DIAMOND POWDERS UNDER HIGH TEMPERATURE AND PRESSURE

Bill J. Pope, Provo, Utah, assignor to Megadiamond Corporation, Provo, Utah

Filed Nov. 1, 1972, Ser. No. 302,986
Int. Cl. C01b *31/06*
U.S. Cl. 423—446 5 Claims




A sintered diamond article and process for producing same, the process including providing a plural cavity mold, packing the mold cavity with particulate diamond with or without additives and thereafter sintering the particulate diamond under high temperature and high pressure to form a solid, non-porous diamond mass in the configuration of the mold cavity.

3,819,815

## SULFATE REMOVAL FROM MAGNESIUM CHLORIDE

Hung-Kei H. Lam, Walnut Creek, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

No Drawing. Filed Dec. 24, 1969, Ser. No. 888,038
Int. Cl. C01b *5/30*
U.S. Cl. 423—498 9 Claims

Sulfate impurities in molten magnesium chloride may be rapidly and effectively removed with simultaneous production of magnesium oxide by dispersing finely divided carbon in the molten magnesium chloride phase. The resultant magnesium oxide may then be removed by allowing it to settle to the bottom of the molten bath and withdrawing purified magnesium chloride from the upper portion of the bath.

3,819,816

## PROCESS FOR THE MANUFACTURE OF SULFUR OR SULFURIC ACID FROM COKE OVEN GAS

Günter Wunderlich, Sterkrader Str. 37, Bottrop, Germany, and Heinrich Weber, Lenaustr. 2, Recklinghausen, Germany

Continuation-in-part of abandoned application Ser. No. 38,255, May 18, 1970. This application Apr. 20, 1972, Ser. No. 246,041
Claims priority, application Germany, May 21, 1969, P 19 25 839.0, P 19 25 840.3
Int. Cl. C01b *17/02, 17/16, 17/72*
U.S. Cl. 423—522 5 Claims

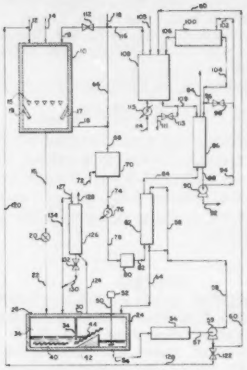
A process is described for the complete elimination of ammonia and hydrogen sulfide from coke oven gases, in which the gases are scrubbed with water and the aqueous $NH_3$-solution is recycled and the laden water and aqueous $NH_3$-solution is desorbed with steam or with either combustible or non-combustible gases in a deacidification process, thereafter enriching $NH_3$ and $H_2S$ in the desorption gases or damp vapors, and scrubbing the gases with water and recycling; the damp vapors are burned with sufficient air for converting ammonia to nitrogen and water, and obtaining elementary sulfur or sulfuric acid from the hydrogen sulfide. In this process, the damp vapors recovered from the deacidification are divided into two fractions, one containing ammonia essentially free from hydrogen sulfide and the other containing hydrogen sulfide essentially free from ammonia, and the two fractions are burned separately, after which the condensate is separated from the gaseous combustion product streams and the two streams combined, whereby the temperature and/or concentration of the gases is adjusted before being processed further.

3,819,817

## HYDROGEN SULFIDE SYNTHESIS

William Van Slyke, 2549 Harris Ave., Richland, Wash. 99352

Filed Mar. 10, 1972, Ser. No. 233,443
Int. Cl. C01b *17/16*
U.S. Cl. 423—563 17 Claims



A process for the synthesis of hydrogen sulfide free of carbon dioxide comprising the steps of reacting a sulfur bearing material such as sodium sulfate or sodium sulfite with oxygen, carbon and steam under reducing conditions in the presence of hydrogen sulfide to produce sodium sulfide. This sodium sulfide is then reacted with acid to liberate hydrogen sulfide.

3,819,818

## RECOVERY OF HYDROGEN PEROXIDE FROM AN AQUEOUS SOLUTION BY DISTILLATION WITH ORGANIC EXTRACTANTS

Gunter Giesselmann, Geusenstamm, Heinz Monch, Freigericht, Gerd Schreyer, Grossauheim, and Otto Weiberg, Neu Isenburg, Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

No Drawing. Filed May 18, 1972, Ser. No. 254,425
Claims priority, application Germany, May 21, 1971, P 21 25 159.2
Int. Cl. B01j *9/22*
U.S. Cl. 423—588 20 Claims

Hydrogen peroxide is converted from an aqueous solution into vapor or liquid mixtures with non aqueous compounds by extracting aqueous solution of hydrogen peroxide with high boiling solvents which have a high selectivity for hydrogen peroxide and are resistant to hydrogen peroxide and water. A portion of the water also extracted is directly distilled from the resulting extraction mixture without addition of an entraining agent. Subsequently the hydrogen peroxide is vaporized in a vacuum from the water poor extract with addition in the vapor phase of the

desired mixing partner which boils lower than the extracting agent whereupon the hydrogen peroxide containing vapors are drawn off or condensed. The hydrogen peroxide containing vapors can be purified by partial condensation and the high boiling solvent can be returned to the extraction step.

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## 3,819,819
## ALUMINUM HYDRIDE IN HEXAGONAL OR RHOMBOHEDRAL CRYSTALLINE FORM

**Norman E. Matzek, Midland, and Donald F. Musinski, Bay City, Mich., assignors to The Dow Chemical Company, Midland, Mich.**

**No Drawing. Filed Mar. 8, 1962, Ser. No. 179,509**
**Int. Cl. C01b *6/00*; B01j *17/00***
**U.S. Cl. 423—645** **2 Claims**

1. A hexagonal crystalline aluminum hydride having a unit cell dimension of about $a$=4.44±.02 A. and $c$=5.89±.02 A. determined by an X-ray diffraction powder pattern, a density of greater than about 1.4 grams per cubic centimeter and a characteristic X-ray powder diffraction pattern corresponding to

| *d*: | *I*/*I*$_1$ | *d*: | *I*/*I*$_1$ |
|---|---|---|---|
| 3.85 | 10 | 1.374 | 6 |
| 3.22 | 100 | 1.300 | 7 |
| 2.34 | 25 | 1.280 | 4 |
| 2.22 | 19 | 1.166 | 2 |
| 1.965 | 4 | 1.126 | 2 |
| 1.825 | 11 | 1.110 | 2 |
| 1.607 | 11 | 1.072 | 3 |
| 1.469 | 17 | 1.048 | 3 |
| 1.410 | 11 | 1.034 | 3 |
| 1.002 | 3 | 0.897 | 1 |
| 0.982 | 0.5 | 0.871 | 1.5 |
| 0.965 | 2 | 0.863 | 1.5 |
| 0.948 | 1 | 0.843 | 1.5 |
| 0.914 | 2 | 0.837 | 1.5 |

2. A rhombohedral, crystalline aluminum hydride prepared by desolvation and conversion of freshly prepared ether solvated aluminum hydride wherein said ether solvated aluminum hydride is intermixed with an alkali metal borohydride thereby to desolvate said aluminum hydride and heating said desolvated aluminum hydride in the presence of said alkali metal borohydride at a temperature of from about 60 to about 75° C. for about 1 to 2 hours thereby to prepare said rhombohedral crystalline aluminum hydride having unit cell dimensions $a$=3.18±.02 A. and $c$=15.6±.02 A. and a characteristic X-ray powder diffraction pattern corresponding to

| *d*: | *I*/*I*$_1$ | *d*: | *I*/*I*$_1$ |
|---|---|---|---|
| 5.25 | 100 | 1.59 | 17 |
| 2.71 | 53 | 1.372 | 11 |
| 2.60 | 53 | 1.356 | 13 |
| 2.49 | 11 | 1.259 | 12 |
| 2.21 | 13 | 1.213 | 8 |
| 1.73 | 33 | | |

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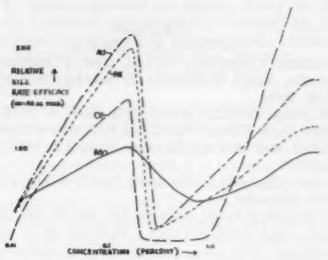
## 3,819,820
## IRRADIATED SUBSTANCE AND COMPOUND AND METHOD OF PREPARING THE SAME

**John Lorina, 30 Pond St., Hull, Mass. 02045; G. Ronald Aluisy, 699 Bridge St., North Weymouth, Mass. 02169; Norman D. Loud, 39 Academy Ave., East Weymouth, Mass. 02169; and Robert H. Rines, 25 Shady Brook Lane, Belmont, Mass. 02178**

**Continuation-in-part of abandoned application Ser. No. 749,141, July 31, 1968. This application Sept. 18, 1969, Ser. No. 859,141**
**Int. Cl. A61k *27/04***
**U.S. Cl. 424—1** **14 Claims**

This disclosure deals with novel irradiated substances and compounds preferably containing a rather critical concentration of colloidal particulate heavy metals including the noble heavy and transition metals, and having among other advantageous uses, unusual efficacy as a




bactericide and a cell and tissue healer, non-irritating to the user.

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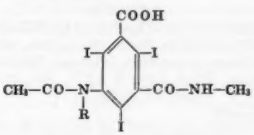
## 3,819,821
## X-RAY OPACIFIERS

**Guy Tilly, Drancy, France, assignor to Laboratoires Andre Guerbet, Aulnay-sous-Bois, France**

**Filed Apr. 5, 1971, Ser. No. 131,344**
**Claims priority, application France, Apr. 15, 1970, 7013555**
**Int. Cl. A61k *27/00***
**U.S. Cl. 424—5** **6 Claims**

The acids of the formula:




in which R is alkyl are X-ray opacifiers.

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## 3,819,822
## DIAGNOSTIC AGENT FOR DETECTION OF PRIMARY HEPATOMA

**Hidetaka Nagai, Tokyo, Eiichi Sato, Funabashi, and Fujio Kobayashi, Tokyo, Japan, assignors to Kowa Company, Ltd., Naka-ku, Nagoya, Japan**

**No Drawing. Filed Dec. 17, 1970, Ser. No. 99,312**
**Claims priority, application Japan, Dec. 18, 1969, 44/101,870; Feb. 19, 1970, 45/14,335; July 29, 1970, 45/66,238; Aug. 28, 1970, 45/75,452**
**Int. Cl. G01n *31/02, 33/16***
**U.S. Cl. 424—8** **6 Claims**

A diagnostic agent for primary hepatoma comprising anti-α1-fetoglobulin, and a process for the preparation of the diagnostic agent for primary hepatoma which comprises the steps of dissolving the anti-α1-fetoglobulin together with a support medium and allowing the same to solidify in a diffused condition.

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## 3,819,823
## MOSQUITO COIL CONTAINING A CHRYSANTHEMIC ACID ESTER

**Yositosi Okuno, Toyonaka, Japan, assignor to Sumitomo Chemical Company, Limited, Osaka, Japan**

**Filed Nov. 4, 1970, Ser. No. 86,840**
**Claims priority, application Japan, Nov. 14, 1969, 44/91,617**
**Int. Cl. A01n *9/24, 17/04***
**U.S. Cl. 424—40** **3 Claims**

A novel insecticidal composition in the form of fumigant which comprises, as an active ingredient, dl-2-allyl-3-methyl-cyclopent - 2 - ene - 1 - one-4-yl d-transchrysanthemate consisting of dl-allethrolone and d-trans-chrysanthemic acid, and an inert carrier, which has a rapid

knockdown effect and an effect to delay the recovery of injurious insects knocked down, and which is useful for sanitary, agricultural and horticultural purposes.

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**3,819,824**
**SOLUBLE TABLETS**
**Gianbattista Crivellaro, Milan, and Francesco Oldani, Trecella, Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy**
**No Drawing. Original application Nov. 4, 1970, Ser. No. 86,946, now Patent No. 3,719,599, dated Mar. 6, 1973. Divided and this application Nov. 13, 1972, Ser. No. 306,331**
**Int. Cl. A61j** *3/10;* **A61k** *11/02;* **C10m** *7/48*
**U.S. Cl. 424—44** **4 Claims**

A lubricating agent suitable for use in the preparation of water soluble tablets and a method of its preparation are disclosed. The agent comprises in combination a composition of substantially anhydrous sodium sulfate and a dimethylpolysiloxane.

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**3,819,825**
**SKIN CONDITIONING COMPOSITION**
**William D. Goodwin, Decatur, Ga., assignor to The Athlon Corporation, Atlanta, Ga.**
**No Drawing. Filed Jan. 12, 1972, Ser. No. 217,296**
**Int. Cl. A61k** *7/00*
**U.S. Cl. 424—47** **7 Claims**

A skin conditioner and temporary wrinkle remover for topical application to human skin includes as its active ingredients a whole protein component of keratinaceous material and colloidal silica.

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**3,819,826**
**COMPOSITION AND MEANS FOR ORAL HYGIENE**
**Gaetano F. D'Alelio, South Bend, Ind., assignor to Doan Associates, Midland, Mich.**
**No Drawing. Filed Aug. 9, 1972, Ser. No. 279,057**
**Int. Cl. A61k** *7/16*
**U.S. Cl. 424—49** **14 Claims**

Dental *calculus* and tartar, as well as the plaque which leads to the formation of same, are removed from teeth and other portions in the oral cavity by use of compositions constituting or comprised of certain organic carbonates, such as ethylene and propylene carbonate and the like, and/or dimethylsulfoxide.

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**3,819,827**
**ALUMINUM OXIDE CONTAINING HAIR TREATING COMPOSITION**
**Frank J. Berger, Englewood, and George H. Megerle, Montvale, N.J., assignors to Wella Corporation, Englewood, N.J.**
**No Drawing. Filed Nov. 9, 1970, Ser. No. 88,131**
**Int. Cl. A61k** *7/06, 7/08, 7/10*
**U.S. Cl. 424—70** **5 Claims**

A hair treating composition which contains a setting agent or a shampoo or a hair conditioning agent and which may also contain a dyeing or shading agent and additionally includes finely divided aluminum-III-oxide so as to adapt the hair better for shaping and to improve the permanency of such shaping.

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**3,819,828**
**ANHYDROUS HAIR TREATING PRODUCT CONTAINING A MONOPERSULFATE SALT**
**Bobby Ray McCoy, Hamilton, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio**
**No Drawing. Filed Feb. 16, 1973, Ser. No. 333,237**
**Int. Cl. A61k** *7/10*
**U.S. Cl. 424—71** **9 Claims**

An anhydrous water dispersible composition comprising a monopersulfate salt of the formula $MHSO_5$, wherein M is an alkali metal cation; a compatible organic diluent; and a compatible alkaline buffering material to adjust the pH of aqueous solutions containing this composition to within the range of from about 7 to about 11, said anhydrous composition desirably including a compatible surfactant selected from the group consisting of soaps and anionic, semipolar nonionic, amphoteric, and zwitterionic synthetic surfactants.

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**3,819,829**
**METHOD FOR CONTROLLING FUNGAL DISEASES OF PLANTS**
**Elton W. Mann, Portales, N. Mex., assignor to Research Corporation, New York, N.Y.**
**No Drawing. Application Oct. 3, 1967, Ser. No. 672,462, now Patent No. 3,617,448, which is a continuation-in-part of abandoned application Ser. No. 334,907, Dec. 31, 1963. Divided and this application Mar. 4, 1971, Ser. No. 121,199**
**Int. Cl. A01n** *15/00*
**U.S. Cl. 424—93** **2 Claims**

A water-soluble antibiotic substance having anti-fungal, anti-viral, anti-nematodal and anti-bacterial properties is elaborated by the organism *Bacillus uniflagellatus,* sp. n., (ATCC 15134).

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**3,819,830**
**METHOD FOR TREATING DISEASES BY CO-ENZYME A AND ADENOSINE TRIPHOSPHATE AND COMPOSITION THEREFOR**
**Yoshio Yoshimura, Nishinomiya, Kanoo Hosoki, Toyonaka, Shigeru Kurooka, Fujiidera, and Kenichiro Iwamura, Tokyo, Japan, assignors to Dainippon Pharmaceutical Co., Ltd., Osaka, Japan**
**No Drawing. Filed June 23, 1972, Ser. No. 265,488**
**Claims priority, application Japan, July 1, 1971, 46/48,617**
**Int. Cl. A61k** *19/00*
**U.S. Cl. 424—94** **3 Claims**

Method for treating diseases due to abnormal metabolism of lipids and carbohydrates, particularly fatty liver, more particularly diabetic fatty liver and alcoholic fatty liver by administering coenzyme A and adenosine triphosphate, and pharmaceutical composition therefor containing as the essential active ingredients coenzyme A and adenosine triphosphate and stable pharmaceutical composition containing calcium gluconate or calcium ascorbate as stabilizer.

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**3,819,831**
**ANGIOTENSIN CONVERTING ENZYME INHIBITOR-FRACTIONATED SNAKE VENOM**
**Miguel Angel Ondetti, North Brunswick, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.**
**No Drawing. Continuation-in-part of abandoned application Ser. No. 837,888, June 30, 1969. This application Sept. 21, 1971, Ser. No. 182,560**
**Int. Cl. A61k** *17/00*
**U.S. Cl. 424—98** **4 Claims**

Disclosed herein is a process for the fractionation of snake venom and the utilization of certain of the resultant fractions as angiotensin converting enzyme inhibitors.

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**3,819,832**
**ANTIVIRAL AGENT FWH-775 AND METHOD OF PRODUCTION**
**Narendra N. Joshi, 345 Gratton St., Montreal 378, Quebec Canada**
**No Drawing. Continuation-in-part of application Ser. No. 64,025, July 20, 1970, which is a continuation of application Ser. No. 616,159, Feb. 15, 1967, which in turn is a continuation of application Ser. No. 547,167, May 3, 1966, all now abandoned. This application May 2, 1972, Ser. No. 249,504**
**Int. Cl. A61k** *21/00*
**U.S. Cl. 424—115** **5 Claims**

The present invention relates to a new antiviral substance. More particularly, the present invention relates to a new antiviral substance obtained from a fermentation process utilizing a novel microorganism of the species *Aspergillus niger.* The antiviral substance has been found to be

effective against both DNA and RNA viruses in laboratory animals.

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3,819,833

## ANTIBIOTIC LARGOMYCIN AND A METHOD OF PRODUCING SAME BY CULTIVATING *STREPTOMYCES PLURICOLORESCENS* NRRL 3679

Nakao Ishida, Sendai, and Tomoharu Okuda, Tokyo-to, Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Filed Feb. 16, 1970, Ser. No. 11,770
Claims priority, application Japan, Feb. 19, 1969, 44/12,351
Int. Cl. A61k *27/00*
U.S. Cl. 424—117 10 Claims

A novel antibiotic largomycin, consisting of at least three components designated as F I, F II and F III respectively, produced by cultivating *Streptomyces pluricolorescens* NRRL 3679 in a nutrient medium under aerobic conditions and recovering the accumulated antibiotic from the fermentation broth. The antibiotic exhibits antimicrobial activity and activity against Ehrlich's ascites carcinoma in mice.

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3,819,834

## ESPINOMYCIN ANTIBIOTICS AND METHODS OF PREPARING SAME

Sumio Umezawa, Tokyo, Isamu Machida, Hatogaya, Susumu Shiotsu and Kimio Yokota, Urawa, Shigehide Makino, Tokyo, Gaku Kawaguchi, Gyoda, and Kazutoshi Honda, Tokyo, Japan, assignors to Meji Seika Kaisha, Ltd., Tokyo, Japan

Continuation of abandoned application Ser. No. 62,055, Aug. 7, 1970. This application Apr. 18, 1972, Ser. No. 245,178
Int. Cl. A61k *21/00*
U.S. Cl. 424—120 8 Claims

A new group of antibiotics, the Espinomycins, are described along with methods for obtaining them from *Streptomyces fungicidicus varietus espinomyceticus*. The antibiotics belong to the macrolide group of antibiotics, and show a high activity against gram-positive organisms. They are suitable for oral administration, and show a low toxicity to the host.

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3,819,835

## ANTIBIOTIC T-24146 AND PROCESS FOR PREPARING SAME

Toru Hasegawa, Kawanishi, Teruji Henmi, Amagasaki, Takaaki Kamiya, Takatsuki, and Hidesuke Iwasaki, Itami, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Dec. 14, 1971, Ser. No. 207,851
Claims priority, application Japan, Dec. 14, 1970, 45/111,513
Int. Cl. A61k *21/00*
U.S. Cl. 424—122 4 Claims

Antibiotic T-24146 is prepared by culturing a microorganism of the genus *Streptomyces*, such as *Streptomyces viridochromogenes* (ATCC 21765), in a culture medium.

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3,819,836

## METHOD FOR THE PRODUCTION AND ISOLATION OF ANTIBIOTIC AV290 SULFATE

Ping Shu, Pomana, and Murray Dann, Pearl River, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Continuation-in-part of abandoned application Ser. No. 117,074, Feb. 19, 1971. This application May 4, 1972, Ser. No. 250,259
Int. Cl. A61k *21/00*
U.S. Cl. 424—124 1 Claim

This disclosure describes a multistep process for recovering highly purified antibiotic AV290 from a fermentation whole harvest mash obtained by the cultivation under controlled conditions of *Streptomyces candidus* NRRL 3218 and mutants thereof.

3,819,837

## CONTINUOUS DOUGH MAKING PROCESS

Billy M. Keith, James R. Bussey, Sidney E. Cannon, James C. Patton, Donald W. Hatch, Perry G. Fisher, Joseph H. Caldwell, and Ralph H. Crocker, Jr., Dallas, Tex., assignors to Campbell Taggart, Inc., Dallas, Tex.

Filed Feb. 2, 1972, Ser. No. 222,905
Int. Cl. A21c *1/06;* A21d *8/02*
U.S. Cl. 426—27 1 Claim

A continuous dough making process wherein all the ingredients of the dough are mixed, the mixture is deposited in a pump which pumps same through a conduit and deposits same in a developer where it is alternately stretched and compressed to knead same by interengaging rotatable vanes or paddles as it is passed therethrough at a regulated temperature, and the dough is extruded from the developer through an outlet passage onto a weighing conveyor which automatically controls the rate of feeding the dough to the developer and thereby the rate of feeding same therefrom, and continuously dividing, rounding, proofing, molding and panning the dough for deposit in the proof box and therefrom into the oven.

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3,819,838

## ENCAPSULATED FLAVORING COMPOSITION

Ross Alexander Smith and Andreas Lambrou, London, England, assignors to Bush Boake Allen Limited, London, England

No Drawing. Filed Aug. 4, 1970, Ser. No. 60,939
Int. Cl. A23l *1/22, 1/26;* B01j *13/02*
U.S. Cl. 426—89 5 Claims

A solid particulate composition containing multiple capsules each consisting of at least one primary capsule wherein the active ingredient is encapsulated in a water-soluble encapsulating material and the primary capsule is being re-encapsulated in a water-insoluble encapsulating material. The active ingredient encapsulated in the primary capsule is a flavoring composition containing volatile components which are released during cooking and baking to flavor the product with which the said encapsulated material is admixed before or during the cooking and baking process. The flavoring composition consists essentially of a flavoring essence selected from the group consisting of essential oils, oleoresins and mixtures thereof.

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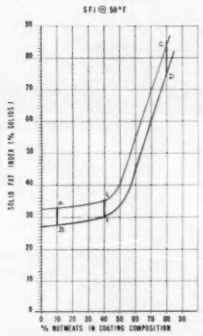
3,819,839

## NUTMEAT COATING COMPOSITIONS FOR CONFECTIONERY PRODUCTS

Michael J. Pichel, Ithaca, N.Y., assignor to Swift & Company, Chicago, Ill.

Filed Feb. 7, 1972, Ser. No. 224,193
Int. Cl. A23g *3/00;* A23l *1/36*
U.S. Cl. 426—93 10 Claims



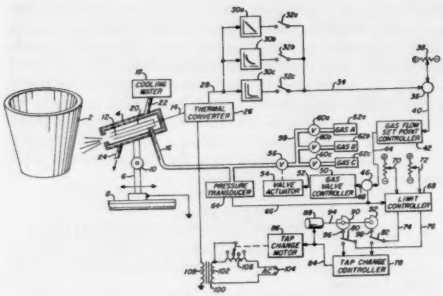

A method of preparing unique nutmeat-based coating compositions comprising a blend of nuts and a broad plastic range fat, and to confections and dairy products coated therewith.

# ELECTRICAL

## 3,819,840
## CONTROL SYSTEM FOR TORCH CURRENT IN A PLASMA ARC FURNACE

**Ronald G. Schultz, Bay Village, Ohio, assignor to United States Steel Corporation, Pittsburgh, Pa.**

**Filed May 18, 1972, Ser. No. 254,586**
**Int. Cl. H05b 7/00**
**U.S. Cl. 13—1** **4 Claims**

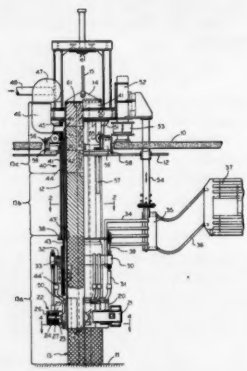



A control system for the torch current of a plasma arc torch has a thermal converter providing a signal representative of the torch current. A function generator, based on the ionizing gas used, alters the signal to provide an inverse torch current characteristic signal which is compared to a desired inverse torch characteristic signal and the resultant error used to control gas flow to the torch. When gas pressure becomes too high or too low, a controller alters a reactance in the series with the primary winding of the power supply transformer to change the electrode voltage.

## 3,819,841
## IRON-FREE SELF-BRAKING ELECTRODE

**John A. Persson, Gibsonia, Pa., assignor to Pennsylvania Engineering Corporation, Pittsburgh, Pa.**

**Filed Aug. 6, 1973, Ser. No. 385,825**
**Int. Cl. H05b 7/06**
**U.S. Cl. 13—18** **29 Claims**

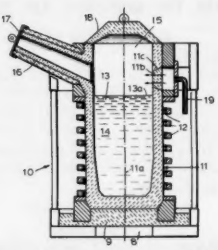


A self-baking electrode for an electric furnace comprises a permanent tubular casing which extends beneath the furnace hood toward the furnace charge. A ram located over the top end of the casing can be retracted for inserting electrode paste and can be advanced for compacting the paste and extruding the baked portion of the electrode from the lower end of the casing. The lower end is articulated in a region which is engaged by electrode contact plates that exert a pressure on the casing and the baked electrode to permit extrusion at a controlled rate. The casing is surrounded by a mantle which is insulated and defines an annular gap around the casing. Hot gas is forced axially through the gap of the casing to melt and precure the electrode paste prior to the paste passing through the region of exit and electrode contact. The usual apparatus for advancing and retracting the whole electrode forming apparatus and electrode with respect to the furnace charge is also provided.

## 3,819,842
## METHOD AND FURNACE FOR MAINTAINING THE TEMPERATURE LEVEL OF METAL MELTS

**Rudolf Gesek; Walter Fadler, both of Vienna, Austria, and Georg Bohm, Heddesheim, Germany, assignors to Elin Union A.G. fur Elektrische Industrie, Wien, Austria and Badische Anilin- & Soda Fabrik A.G., Ludwigshafen, Germany**

**Filed Apr. 24, 1972, Ser. No. 246,545**
**Int. Cl. H05b 5/00**
**U.S. Cl. 13—27** **14 Claims**



A holding furnace comprising a crucible having a cover, an induction coil around the crucible and a gas permeable guiding means in the furnace above the melt level for introducing a protective gas into the sealed furnace.

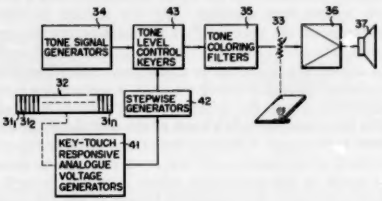
## 3,819,843
## KEYBOARD ELECTRONIC MUSIC INSTRUMENT WITH STEP-WISE VARIABLE VOLUME CONTROL RESPONSIVE TO KEY-TOUCH

**Shimaji Okamoto, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Shizuoka-ken, Japan**

**Filed May 11, 1973, Ser. No. 359,362**
**Claims priority, application Japan, May 11, 1972, 47-46804**
**Int. Cl. G10h 1/00**
**U.S. Cl. 84—1.1** **8 Claims**

A keyboard electronic musical instrument having a volume control arrangement responsive to each key-touch on the keyboard of the instrument, the volume control arrangement comprising an analogue voltage generator for producing an analogue voltage in proportion to the magnitude of a key depressing force, a stepwise converter for producing one of several different digital voltages stepwisely responsive to the analogue voltage, and a tone level control circuit for varying in accordance with the digital voltage from the stepwise con-

verter, the level of a tone signal delivered from a tone signal generator upon selective depression of any key on the instrument keyboard, whereby musical tones emanated from the instrument have their volumes varied in a discontinuous digital manner with the magnitude of the key depressing speed.

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**3,819,844**

## ELECTRONIC MUSICAL INSTRUMENT KEYING SYSTEM WITH ENVELOPE SAMPLE MEMORIZING VOLTAGE DIVIDERS

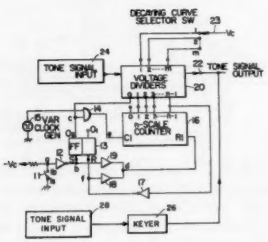
**Sigeki Isii, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Shizuoka-ken, Japan**

**Filed Nov. 10, 1972, Ser. No. 305,284**

**Claims priority, application Japan, Nov. 18, 1971, 46-92560; Nov. 18, 1971, 46-92561; Nov. 18, 1971, 46-92562**

**Int. Cl. G10h** *1/02*

**U.S. Cl. 84—1.26** **17 Claims**




An electronic musical instrument keying system comprises, for each tone signal to be keyed, a keyer constituted by a plurality of voltage dividers and switching elements, and a keyer drive circuit having an *n*-scale counter and a counter drive pulse generator associated with a key-operated switch. The keyer includes a sequentially changing-over voltage divider network having a common input resistor and a plurality of shunt resistors each with the series-connected switching element, wherein resistance values of the shunt resistors are so selected as to represent the sampled levels of the intended keying envelope for the tone signal, the tone signal being supplied through the input resistor and the output of the keyer being derived from the junction between the input resistor and the shunt resistors. Individual switching elements are sequentially rendered conductive by successive pulses from the counter to successively establish the voltage dividers one after another to determine the tone levels successively, thereby forming an envelope. Key touch-responsive tone level determining circuit constructed by a similar voltage divider network may be used with the keyer to control the input tone signal level to the keyer in response to the depression speed of the key. The keying system eliminates the use of a large capacity of capacitors which are required in RC timing circuits in the conventional system, and facilitates the fabrication in an integrated circuit form by mass production.

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**3,819,845**

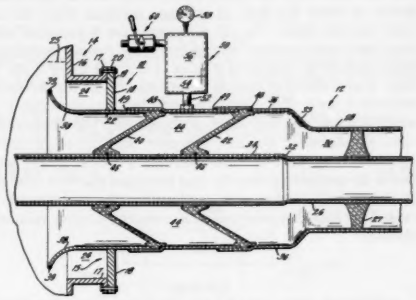
## TERMINATION FOR METAL ENCLOSED, COMPRESSED GAS INSULATED ELECTRICAL CONDUCTOR

**Vasu H. Tahiliani, New Stanton, Pa., assignor to I-T-E Imperial Corporation, Spring House, Pa.**

**Filed Feb. 23, 1973, Ser. No. 335,326**

**Int. Cl. H02g** *15/22*

**U.S. Cl. 174—11 R** **26 Claims**



A high voltage conductor is enclosed in a grounded metal enclosure. The conductor is insulated from the enclosure by a compressed insulating gas. The conductor extends through while its enclosure terminates at a termination apparatus at the wall of the oil filled tank of an electrical component, like a transformer. The termination apparatus comprises a pair of spaced, enclosure sealing, barrier insulators, which are positioned in the enclosure and define a compartment between them. Behind one insulator is the oil of the transformer tank and behind the other insulator is sealed the insulating gas. The intermediate compartment is filled with transformer oil. Leakage of insulating gas past its sealing insulator is trapped in the intermediate compartment and the gas is thereby kept out of the transformer tank.

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**3,819,846**

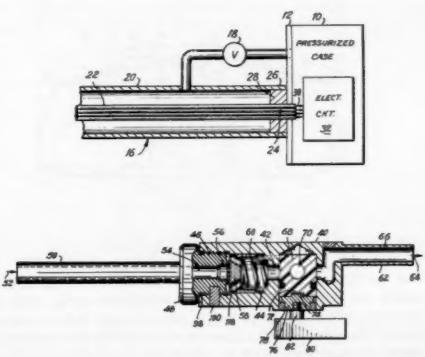
## ELECTRICAL APPARATUS WITH BYPASS CHECK VALVE TO PREVENT FLOW INTO FEEDER LINE

**William J. Jakobsen, Farmingdale, N.Y., assignor to Lourdes Industries, Inc., Farmingdale, N.Y.**

**Filed Apr. 30, 1973, Ser. No. 355,759**

**Int. Cl. H02g; F16k** *15/18, 25/00*

**U.S. Cl. 174—11 R** **12 Claims**




Telephone apparatus comprising a pressurized cable including internal conductors with a cable cover surrounding the

conductors and adapted to withstand an internal pneumatic pressure. A pressure-tight case housing electronic circuitry is arranged adjacent the end of the cable and the conductors extend through the cable cover in sealed relationship into the case whereat the conductors are connected to the aforesaid circuitry. A valve arrangement is provided bypassing the portion of the conductors connecting the pressurized cable to the case. This valve arrangement includes a manual control to isolate the case from the pressurized cable and a check valve device to limit the flow of pressure medium from the case back into the cable. The valve arrangement is provided with a valve body and a poppet arrangement, the poppet including an inset adapted for engaging a valve seat in the valve body. The inset is of a material having a hardness of 50–80 on the Durometer A scale. The manual control includes a rotatable part which is made of a fluorocarbon compound. The poppet of the valve arrangement includes a poppet body having a circular skirt which at least in part encircles a helical spring which forces the poppet against the seat provided therefor. The poppet body is provided with a plurality of symmetrically arranged inclined bores arranged in concentric array relative to the skirt.

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**3,819,847**

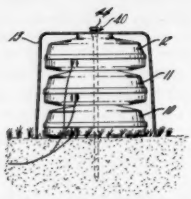
**METHOD AND APPARATUS FOR STORING BURIED TELEPHONE DISTRIBUTION WIRES**

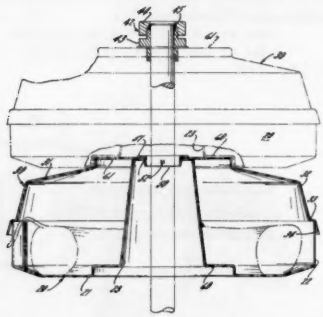
**Joseph T. Charles, 2 Woodbine, Rolling Meadows, Ill. 60008**

**Filed Apr. 16, 1973, Ser. No. 351,379**

**Int. Cl. H02g** *9/00*; **B65d** *21/00*; **B65h** *49/00*

**U.S. Cl. 174—37** **17 Claims**





A method of installing buried distribution wires (BDW) which are spliced into a buried telephone cable with the resulting splices enclosed below ground level before completion of the subscriber facilities to be served by the distribution wires. Each spliced BDW is rolled into a coil and placed in a separate container, and a plurality of the separate containers are stacked on top of each other and secured to the earth, either above or below ground level. Later, when the respective subscriber facilities are completed, each BDW is removed from its container and the free end thereof is connected to the respective subscribed facility without making any additional buried splices. Each of the containers for one BDW comprises two annular sections with the lower section forming a frustoconical hollow core member. The top section includes a lateral flange on the lower end which bears against the top of the outer sidewall of the lower section so that weight applied to the top of the container is transmitted both through the sidewalls and through the core member. Apertures are formed in the centers of both the upper and lower sections to permit a stake to be passed through a stack of the containers for securing them to the earth. A security cover may be placed over the entire stack of containers, and this cover may also be secured to the earth by the same stake which is passed through the stack of containers. An opening is formed in the sidewalls of each container to pass that portion of the BDW that is spliced to the underground cable. The top of each container has a central raised portion which fits into the open lower end of the core member in another container so that the containers nest together when they are stacked.

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**3,819,848**

**WIRING HARNESSES**

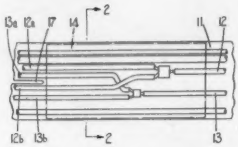
**William Lawrence Fry, Haughton, England, assignor to Rists Wires & Cables Limited, Lyme, Staffordshire, England**

**Filed Sept. 7, 1973, Ser. No. 395,038**

**Claims priority, application Great Britain, Sept. 7, 1972, 41511/72**

**Int. Cl. H02g** *3/02*

**U.S. Cl. 174—72 A** **7 Claims**



A wiring harness including an elongate thermoplastic backing strip to which are secured first and second electrical leads. Each of the leads includes a conductive core in a thermoplastic sheath, and the leads are physically and electrically interconnected. The leads are secured to the backing strip by having their sheaths fused to the backing strip. An insulating cover member is secured to the assembly of the leads and the backing strip and covers the point of interconnection of the leads. The cover member can be a sheet of thermoplastic material, or can be a sleeve actually encircling the point of interconnection of the leads.

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**3,819,849**

**ELECTRICAL CABLE CONNECTING DEVICE**

**Robert W. Baker, Santa Ana, Calif., assignor to Flexible Metal Hose Manufacturing Company, Costa Mesa, Calif.**

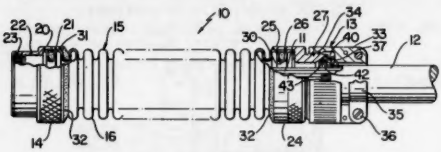
**Filed May 10, 1972, Ser. No. 251,965**

**Int. Cl. H02g** *15/08*

**U.S. Cl. 174—86** **14 Claims**

An electrical cable connecting device comprising a clamp assembly at one end for attaching thereof to a terminal end

portion of an associated electrical cable, an electrical connector adapted to be fixed to the terminal end of such end portion, and a bendable convoluted tubular shell fixed between



the assembly and the connector which allows the end portion of the cable to be bent in a self-supporting manner into an infinte number of positions to allow easy mating thereof with an associated electrical connector.

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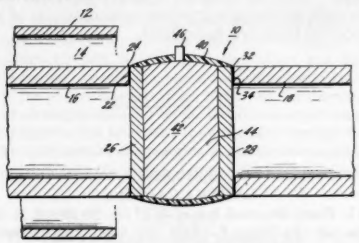
**3,819,850**

**CONDUCTIVE EXPANSION JOINT FOR ELECTRICAL TRANSMISSION SYSTEM**

**Elijah Robert Perry, Scottdale, and John C. Cronin, Greensburg, both of Pa., assignors to I-T-E Imperial Corporation, Spring House, Pa.**

**Filed Dec. 26, 1972, Ser. No. 318,166**
**Int. Cl. H01r** *5/00*
**U.S. Cl. 174—94 R** **9 Claims**



Between two conductor sections of a high voltage transmission system, a conduction joint made from a short section of flexible metal, such as sodium, is inserted. The dimensional changes generated by thermal effects are absorbed by the flexible metal. A sheath around the flexible metal joint keeps the metal in place.

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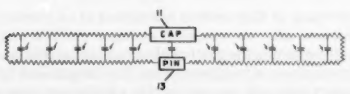
**3,819,851**

**HIGH VOLTAGE ELECTRICAL INSULATOR HAVING AN INSULATOR BODY THE ENTIRE SURFACE OF WHICH IS COVERED BY A SEMICONDUCTIVE GLAZE**

**Olaf Nigol, 272 Markland Dr., Etobicoke, Ontario, Canada**

**Filed Dec. 8, 1972, Ser. No. 313,588**
**Int. Cl. H01b** *17/50*
**U.S. Cl. 174—211** **8 Claims**




A high voltage electrical insulator comprises an insulator body having a pair of upper and lower axially spaced terminals, the entire surface of the body being covered by a semiconductive layer providing a semiconductive path between the terminals, the insulator body providing at least one integral, downwardly depending, bell-shaped portion having an annular rim, said bell-shaped portion shrouding a predetermined area of said surface.

The geometry of the bell-shaped portion of the insulator body is such that the total protected creepage distance along the shrouded area of the surface is at least as great as the effective air clearance between the insulator terminals, the effective air clearance being the length of the total air gap in the shortest arcing path between the insulator terminals when all but the shrouded areas are wetted. The minimum air clearance between the rim of the bell-shaped portion and the next lower unshrouded surface is at least 3.5 inches.

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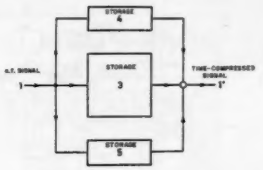
**3,819,852**

**METHOD OF REDUCING THE INTERFERENCE SIGNALS DURING THE TRANSMISSION OF AF SIGNALS IN TIME-COMPRESSED FORM**

**Peter Wolf, Horscheltstr. 3/III, 8000 Munich 40, Germany**

**Filed Aug. 29, 1972, Ser. No. 284,530**
**Int. Cl. H04n** *5/00*
**U.S. Cl. 178—5.6** **1 Claim**




In a known method of transmitting the sound signal associated with a television signal, the sound signal occurring during a field is stored and, subsequently to the video signal, transmitted in time-compressed form during the period of a line in the vertical blanking interval. At the place of reception, this line-by-line division of the sound signal naturally results in disturbing transients and dying-out processes. To avoid this, the invention proposes transmitting the sound signals of the individual fields with a time overlap.

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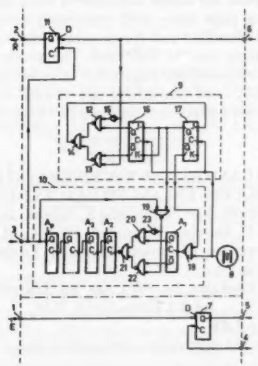
**3,819,853**

**SYSTEM FOR SYNCHRONOUS DATA TRANSMISSION THROUGH A DIGITAL TRANSMISSION CHANNEL**

**Michel Guy Pierre Stein, Bazoches Sur Guyenne (Yveslines), France, assignor to Telecommunications Radioelectriques Et Telephoniques T.R.T., Paris, France**

**Filed Nov. 6, 1972, Ser. No. 303,978**
**Claims priority, application France, Nov. 18, 1971, 7141258**
**Int. Cl. H04l** *7/00*
**U.S. Cl. 178—68** **1 Claim**



A system for synchronous data transmission through a digital transmission channel whose transmission clock is inde-

pendent of the data clock. The data signal to be transmitted is sampled at the transmitting terminal with the transmission clock and the data signal is recovered at the receiving terminal from the received digital signal of the transmission channel by sampling this signal by means of a regenerated local data clock which is synchronized with the mean phase position of the transitions in the received digital signal. As a result both a high transmission efficiency and a low distortion of the recovered data signal is obtained.

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**3,819,854**

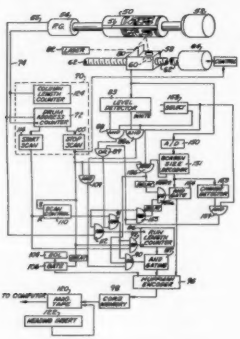
**COMPOSING APPARATUS**

**Edwin R. Kolb, University Heights, Ohio, assignor to Harris-Intertype Corporation, Cleveland, Ohio**

**Division of Ser. No. 13,069, Feb. 20, 1970, Pat. No. 3,626,824. This application Sept. 14, 1971, Ser. No. 180,355**

**Int. Cl. H04n** *1/28;* **B41b** *27/18*

**U.S. Cl. 178—6.7 R** **4 Claims**



Composing method and apparatus for publications such as newspapers in which copy from various sources is entered into a computer in coded form for use in controlling a phototypesetter to prepare a page copy. Certain copy including artwork which may be half tone or continuous tone is scanned to provide the numerical data necessary for controlling the photoypesetter while text material is first edited on an editing terminal and then stored with or without phototypesetting instructions in the computer. Each item to be included in the publication is identified by a heading and layout department instructs the computer as to where the items are to appear. For this purpose the layout department has a layout terminal for displaying page areas with previously assigned sections outlined and identified and for entering coordinates of newly assigned sections into the computer. The terminal can display magnified portions of the page area. In reproducing continuous tone copy, dot characters are stored in a character memory and used to provide different half tone screen sizes.

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**3,819,855**

**VIDEO CAMERA AND RECEIVER SYSTEM FOR PRODUCING ENLARGED IMAGES OF WORK**

**Michael M. Rush, Van Nuys; John E. Subers, Jr., Hawthorne, and Peter C. Herring, Rosemead, all of Calif., assignors to Expert Precision Electronic Research Technicians Incorporated, Van Nuys, Calif.**

**Filed Dec. 26, 1972, Ser. No. 318,187**

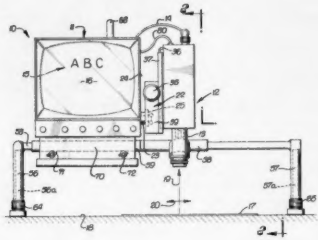
**Int. Cl. H04n** *5/655, 7/18*

**U.S. Cl. 178—7.81** **9 Claims**

Apparatus for displaying a magnified image of an object comprises:

a. a video receiver,

b. a video camera having a lens barrel; the camera electrically connected with the receiver so that the receiver screen displays a magnified image of said object toward which the camera is directed below the level of the camera,




c. first means carried by the receiver and supporting the camera for movement relative thereto at one side thereof, and

d. second means supporting the receiver spaced above the object level, said second means connected with the receiver and being everywhere spaced outside of an object zone below lens barrel level.

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**3,819,856**

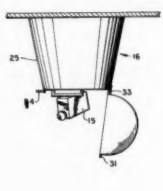
**CAMERA CAPSULE**

**David L. Pearl, deceased, late of 4027 No. Stratford, N. E., Atlanta, Ga. (by Peggy P. Pearl, sole heir), and by David M. Blackshear, 436 Safari Cir., Stone Mountain, Ga.**

**Filed Apr. 17, 1972, Ser. No. 244,469**

**Int. Cl. H04n** *5/26, 7/18*

**U.S. Cl. 178—7.81** **8 Claims**



A television or film camera is attached to an overhead ceiling structure, etc., on a support member which is capable of rotating or panning the camera about a vertical axis and tilting the camera about a horizontal axis. The camera and its movable support structure are enclosed in a stationary housing having a base portion adjacent the ceiling structure and a transparent dome suspended below the base portion. The dome is coated on its inside concave surface with a fine layer of chromium which renders the dome transparent from its relatively dark inside area and opaque or reflective from the lighter area outside the housing. The camera is thus able to assume an infinite number of positions and focus on various objects in its vicinity about the housing without visual detection from without the housing.

## 3,819,857
## ELECTROMAGNETIC INDUCTION TYPE PATTERN INPUT APPARATUS

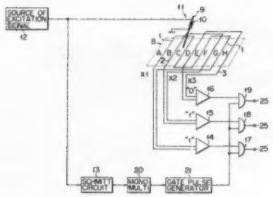
**Seiji Inokuchi, Osaka, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan**

**Filed Nov. 16, 1972, Ser. No. 307,235**

**Claims priority, application Japan, Nov. 17, 1971, 46-91507; Dec. 20, 1971, 46-102672**

**Int. Cl. H04n** *1/00*; **G08c** *21/00*

**U.S. Cl. 178—19** **11 Claims**




An electromagnetic induction type pattern input apparatus comprises an electromagnetic pen including an electromagnetic coil wound upon a magnetic rod; a tablet including a plurality of loop conductors which are arranged, for example on opposite surfaces of an insulator sheet, the conductors on the opposite surfaces of the insulator sheet overlapping with each other and being displaced from each other so that the rectangular coordinate output corresponding to the position of the electromagnetic pen on the insulation sheet can be gray coded; a source of excitation signal for supplying an excitation signal to the electromagnetic pen; and means for detecting the phase of an output induced on the loop conductors according to the magnetic flux produced from the electromagnetic pen, whereby to determine the position of the electromagnetic pen in accordance with the coded output of the loop conductors.

## 3,819,858
## DATA SIGNAL SYNCHRONIZER

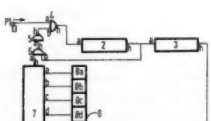
**Werner Paetsch, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany**

**Filed Sept. 25, 1972, Ser. No. 292,114**

**Claims priority, application Germany, Sept. 23, 1971, 2147565**

**Int. Cl. H04l** *7/08*

**U.S. Cl. 178—69.5 R** **6 Claims**



A telegraph signal synchronizer is described which includes a code verifier capable of testing groups of bits in overlapping fashion for determining the presence of a code word. A frequency divider produces an output pulse whenever it receives as many bits as constitute a code word. The divider receives an input signal over an AND gate, which is controlled by output pulses from a code verifier. The code verifier utilizes a preset counter to produce a first signal if it recognizes a code word and a second signal if the bit group undergoing examination does not prove to be a code word. A shift register stores a bit group to be examined. Upon receiving a preceding bit of the message and until receiving a subsequent bit of this message, bits stored in the shift register are read out serially, passed over a feedback path and coupled to an input of the same shift register. All bits except the aforementioned preceding and subsequent bits are coupled to the code verifier counter's input.

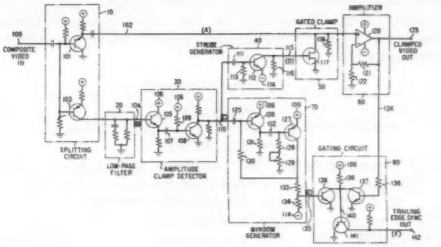
## 3,819,859
## HORIZONTAL SYNC DETECTOR AND VIDEO CLAMP CIRCUIT

**Michael Horward Borsuk, Red Bank; Paul Nolan Browne, Shrewsbury, and Arden Bernard Wright, Ocean Township, Monmouth County, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Dec. 26, 1972, Ser. No. 318,118**

**Int. Cl. H04n** *5/04*

**U.S. Cl. 178—69.5 TV** **4 Claims**




A composite video signal is coupled by way of a first path through a gated clamp circuit to one input of a gating circuit. The composite video signal is also coupled to a low-pass filter which removes high frequency energy in the composite video signal. Amplitude peaks in the video signal at the output of the low-pass filter cause an amplitude detector to develop voltage pulses during each one of the horizontal sync pulse intervals. In response to these voltage pulses, a strobe generator causes the gated clamp to operate and clamp the composite video signal to a reference voltage during the sync interval. In addition, the voltage pulse also causes a monostable multivibrator to generate a window pulse at a second input of the gating circuit, the window pulse having an interval sufficiently long to always encompass the trailing edge of the horizontal sync pulse. As a result, the gating circuit passes the trailing edge of the horizontal sync pulse in the composite video signal and blocks the voltage spikes present during the active region of the video signal.

## 3,819,860
## AUDIO TRANSCEIVER FOR TRANSMITTING TO AND RECEIVING FROM THE EAR CANAL

**Robert N. Miller, 58 Calypso Shores, Novato, Calif. 94947**

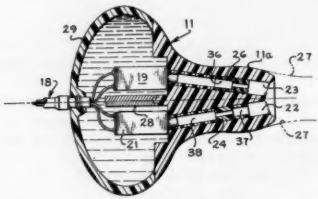
**Filed Sept. 10, 1971, Ser. No. 179,450**

**Int. Cl. H04b** *15/00*

**U.S. Cl. 179—1 P** **2 Claims**

An ear-borne transceiver for transmitting and receiving audio information signals comprises an ear piece having a semi-rigid support body portion formed and adapted to be inserted and snugly received in the outer ear canal. The inserted portion of the support body includes a first and second audio passageway therealong for respectively carrying sound waves therethrough. A uni-directional acoustical filter device is disposed in each of the passageways which respectively serve to pass sounds from and to the ear canal. A microphone element receives sounds from the ear canal via one of the passageways and converts the received sounds into electrical signals to be supplied to a transmitting cable means. A receiving or "speaker" element also carried by the support body

receives electrical signals via a transmit/receive cable means and serves to convert such electrical signals to sounds to be transmitted into the other of the two passageways. The filter device in each passageway serves to dissipate the power or




energy of selected acoustical sounds above a predetermined level so as to limit the transmission and receipt of audio to that portion lying substantially in the voice range. Abrasive background noise is thereby eliminated from signals both as transmitted and as received.

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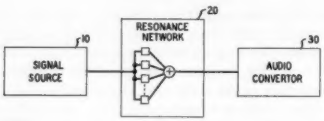
**3,819,861**

## SOUND ENHANCING SYSTEM FOR MUSICAL INSTRUMENTS

**Max Vernon Mathews, New Providence, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Nov. 24, 1972, Ser. No. 309,203**
**Int. Cl. G10h** *5/00*
**U.S. Cl. 179—1 M** **15 Claims**




Apparatus for enhancing the sound quality of musical instruments and of electronic sound sources is disclosed. Electrical signals representative of sound are modulated in a predetermined manner to increase their spectral content and are then processed by a resonance network which alters the amplitude and phase relationships of the various harmonic signal components. The processed signals are then demodulated in accordance with the modulation method used, thereby recreating a distorted replica of the original tone which is rich in harmonics that are uncorrelated in amplitude and in phase with each other. Upon conversion to sound this demodulated signal results in a pleasing tone.

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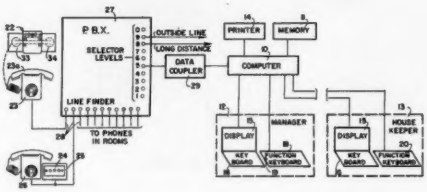
**3,819,862**

## COMMUNICATION SYSTEM WITH PORTABLE UNITS CONNECTED THROUGH A COMMUNICATION CHANNEL TO A COMPUTER FOR APPLYING INFORMATION THERETO

**Walter Paul Hedges, Phoenix, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.**

**Filed Jan. 10, 1972, Ser. No. 216,678**
**Int. Cl. H04m** *11/00*
**U.S. Cl. 179—2 A** **28 Claims**

System for indicating the condition of hotel rooms or the like having a computer coupled to a memory and to display devices, with a communication channel extending from the computer to remote points, such as individual hotel rooms. A portable unit is carried by a maid or other personnel and is adapted to be coupled to a communication channel which may be present for another purpose. For example, the communication channel may be the telephone lines which provide telephone service to the rooms, a television antenna cable, or any other communication channel which is available. The portable unit includes a circuit for transmitting and receiving signals, and switches coupled thereto. When used with a telephone line, the portable units can be coupled thereto through an acoustic coupler, or a receptacle can be provided for the unit which is directly wired to the line. The portable unit or the receptacle can also include a circuit which is




uniquely wired or switched for each room, so that a signal can be sent on the line which identifies the room and the particular portable unit, and which provides information representing the operation of the switches of the portable unit. The portable unit may include batteries for energization of the circuit therein. The information supplied on the communications line is coupled to the computer and stored in the memory thereof, and selectively read out on a visible display and/or printer as desired.

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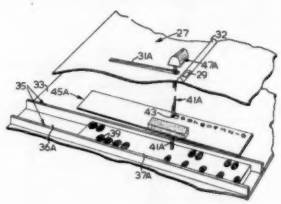
**3,819,863**

## MEDICAL DATA TERMINAL FOR TRANSMITTING ANALOGUE AND DIGITAL DATA

**William F. Slaght, St. Foy, Quebec, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence**

**Filed July 7, 1972, Ser. No. 269,553**
**Claims priority, application Canada, July 9, 1971, 117825**
**Int. Cl. H04m** *11/06*
**U.S. Cl. 179—2 DP** **3 Claims**

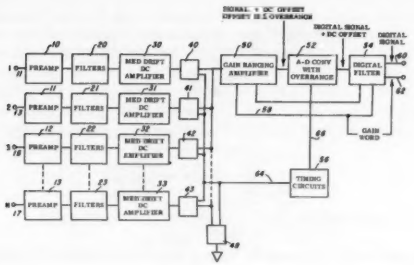



Transmission means adapted for the transmission of medical data over a telephone transmission link to a remote centre for diagnosis, comprises a signal generator, modulation means by which the output of the signal generator can be modulated to transmit binary alphanumeric information over the transmission link, modulation means by which the output of the signal generator can be modulated to transmit non-alphanumeric information as an analogue signal over the transmission link, and coupling means by which the modulated output of the signal generator can be applied to the telephone transmission link.

## 3,819,864
## DIGITAL DC OFFSET REMOVAL METHOD FOR DATA SYSTEMS

**Paul E. Carroll, and Ralph A. Harris, both of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Filed Mar. 30, 1973, Ser. No. 346,518**
**Int. Cl. H04j** *3/00*
**U.S. Cl. 179—15 BL** **8 Claims**



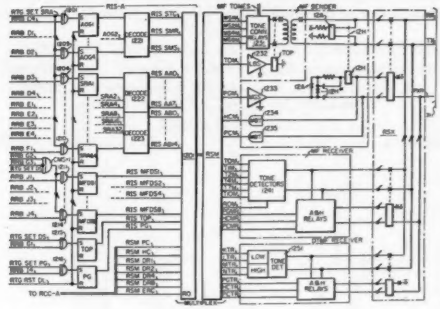

The disclosure relates to dc removal in data systems and in particular to multichannel, multiplexed data, gain ranging, seismic data acquisition systems. A medium drift dc amplifier (approximately ±2.5 $\mu$v/°C) replaces the chopper stabilized amplifier. An overrange capability is provided in both the A/D converter and the gain ranging amplifier so the combined drift of the medium drift amplifier and the gain ranging amplifier over the system temperature is less than the overrange. This eliminates the necessity for rezeroing as the temperature changes or from using part of the converter range for dc drift. The digital filter has at least one word of memory per input channel plus one for each gain of the gain ranging amplifier. The input of the gain ranging amplifier is shorted periodically by Switch S and the average dc offset for each gain of the gain ranging amplifier is accumulated by filtering. An average is also accumulated by filtering for each of the data channels while they are in normal operation. Two cascaded one pole filters which share common hardware are used. The first removes the portion of offset due to the gain ranging amplifier and the second removes the dc offset due to the stabilized amplifier and multiplexer.

## 3,819,865
## ASSIGNMENT AND CONNECTION OF CALL DIGIT RECEIVERS AND SENDERS TO A REGISTER IN A COMMUNICATION SWITCHING SYSTEM

**Fred A. Weber, Glen Ellyn; James P. Caputo, Chicago; John W. Eddy, Villa Park; Phil R. Harrington, Mt. Prospect; Gerald O'Toole, Elmhurst; Sergio E. Puccini, Wood Dale, and Diane L. Adamski, Melrose Park, all of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.**

**Filed May 9, 1973, Ser. No. 358,753**
**Int. Cl. H04j** *3/12*
**U.S. Cl. 179—15 AT** **17 Claims**

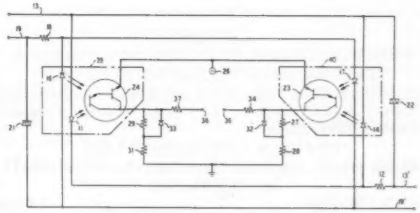
The common control of the switching system comprises two separate subsystems, a stored program data processing unit with a main memory, and a register subsystem with a register memory and a plurality of register junctors in a time division multiplex arrangement. Multifrequency receivers and senders and touch calling tone receivers are connected to the register junctors via a one stage matrix in the register subsystem. The main memory has assignment tables, busy/idle tables and on-line/off-line tables for the receivers and senders which are used with stored program modules to select a sender or receiver, and supply type and address information to the register memory. The register subsystem with hard wired logic operates the matrix to connect the sender or receiver to the register junctor.



## 3,819,866
## LIGHT COUPLED LOOP CURRENT DETECTOR

**George Thomas Hawley, Murray Hill, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Dec. 18, 1972, Ser. No. 316,076**
**Int. Cl. H04m** *3/22*
**U.S. Cl. 179—16 AA** **7 Claims**



This loop current detector includes four light-emitting diodes and a bridge circuit electrically isolated therefrom with two photoresponsive arms and two resistive arms. Two light-emitting diodes are connected in parallel in opposite polarities and inserted in series with each conductor. Each photoresponsive arm is optically coupled to the light-emitting diodes that respond to loop current of a respective sense. Longitudinal currents therefore cause both photoresponsive arms to be illuminated, thereby leaving the bridge in balance; loop currents cause only one photoresponsive arm to be illuminated, thereby providing bridge output.

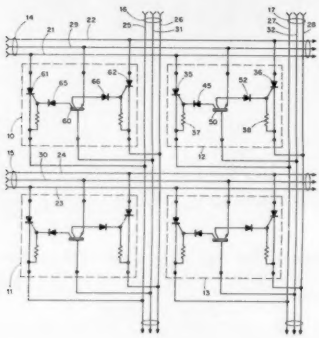
## 3,819,867
## MATRIX EMPLOYING SEMICONDUCTOR SWITCHING CIRCUIT

**Jeremiah P. McCarthy, North Bellmore, N.Y., and William Salmre, Norwalk, Conn., assignors to GTE Laboratories Incorporated, Waltham, Mass.**

**Filed Oct. 12, 1971, Ser. No. 188,164**
**Int. Cl. H04q** *3/50*
**U.S. Cl. 179—18 GF** **6 Claims**

Crosspoint switching array, each crosspoint switching circuit including silicon controlled switches for connecting signal

lines of one group to signal lines of another group. Each switching circuit includes a multiple-collector transistor having its emitter connected directly to the control line of one group of lines and its base connected directly to the control line of one group of lines and its base connected directly to the control line of the other group. The gate electrode of each silicon controlled switch is connected through a blocking diode to separate collector electrodes of the multiple-collector transistor. Coincident pulses on the control lines cause current to flow in the transistor thereby switching the silicon controlled switches to conduction and providing signal paths between the two groups of lines.



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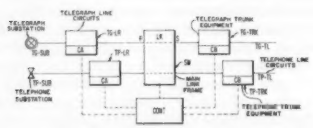
**3,819,868**

## COMMON CONTROL SWITCHING NETWORK FOR TELEGRAPH AND TELEPHONE EXCHANGE

**Kazuya Ozeki; Haruo Mochizuki, and Hiroaki Sasahara, all of Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan**

**Filed Dec. 6, 1972, Ser. No. 312,524**
**Claims priority, application Japan, Dec. 8, 1971, 46-99671**
**Int. Cl. H04q** *3/42*
**U.S. Cl. 179—18 C** **1 Claim**



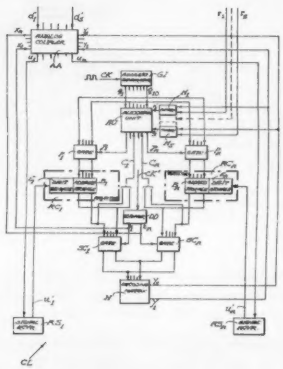
Each link of a common control switching network is capable of transmitting either a telegraph or a telephone signal. Each telegraph and telephone interface device is divided into two portions, one for the transmission of telegraph or telephone signals and the other for transmitting a control signal accompanying the telegraph or the telephone signal between the remaining portion of the interface device and common control equipment. Responsive to the control signal accompanying either telegraph or the telephone signals, the common control equipment makes one of the links establish a connection between two of the interface devices for transmission of the telegraph or the telephone signal accompanied by the control signal between the two interface devices.

**3,819,869**

## LINE CONCENTRATOR FOR TELEPHONE EXCHANGE

**Alfonso Lamartina; Enrico Cicognani, both of Milan; Riccardo Caldarella, Rho, and Athos Antonini, Milan, all of Italy, assignors to Societe Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy**

**Filed Apr. 26, 1973, Ser. No. 354,746**
**Claims priority, application Italy, Apr. 27, 1972, 23585/72**
**Int. Cl. H04q** *11/04*
**U.S. Cl. 179—18 FC** **10 Claims**



A set of *s* incoming two-wire lines, upon carrying multifrequency digital signals from a pushbutton-type station selector, are connectable to a reduced number of *n* outgoing two-wire lines, leading to respective digit decoders, by means of an analog coupler comprising *s* input transformers and *n* output transformers interconnected via a common pair of bus bars which are grounded trough respective resistors. The secondaries of the input transformers and the primaries of the output transformers are connected to these bus bars through diodes normally blocking signal transmission, any of these transformers being made operative through a d-c biasing voltage applied to centertaps of the *s* input secondaries from a decoding matrix and to centertaps of the *n* output primaries from a scanner which cyclically connects that matrix to a set of *n* registers to sample same for the addresses of active incoming lines stored therein under the control of another scanner. The registers so sampled are loaded with the called-number digits from active lines after decoding in the signal receivers to which the digital signals are transmitted through the analog coupler.

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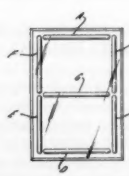
**3,819,870**

## PRIVATE AUTOMATIC TELEPHONE SYSTEM

**Dilip T. Singhi, Chicago, and Richrd J. Medal, Mount Prospect, both of Ill., assignors to Rauland-Borg Corporation, Chicago, Ill.**

**Filed Sept. 28, 1972, Ser. No. 292,957**
**Int. Cl. H04m** *3/60*
**U.S. Cl. 179—26** **16 Claims**



Improvements in a private automatic telephone system for use in schools and other locations where supervisory control

over the use of certain telephones is desired, the system including both dial and dialless telephones. The improvements comprise a display unit associated with preselected dial telephones which sequentially produces a digital visual readout of telephone numbers of dialless telephones which have gone off-hook and which have not been responded to by being called by a party at a dial telephone. Provision is also made for single button dialing of such dialless telephones by dialing a single digit which automatically connects the dial telephone to one of the unresponded to dialless telephones even though the dialless telephone may have a three or more digit telephone number. In the event the dial telephone has the digital readout feature, the party at the dial telephone may call the unresponded to dialless telephones in any desired order by merely waiting until the visual indication of the desired telephone number appears, lifting the receiver off-hook and dialing the single digit to connect the two telephones. Once the telephones are connected, the remaining dialless telephones which have not been responded to will continue to be sequenced in the digital display.

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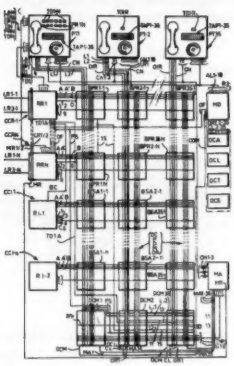
**3,819,871**

## TELEPHONE SWITCHING AND INTERCOM EQUIPMENT

**Roger Verdon, Sartrouville, France, assignor to L'Electronique Appliquee, Montrouge, France**

**Filed May 30, 1972, Ser. No. 257,604**
**Int. Cl. H04q** *3/00*
**U.S. Cl. 179—27 F** **13 Claims**



A telephone switching and intercom equipment comprises an operator's position and a plurality of subsidiary positions. Each position is provided with a direct position selection keyboard including for at least some of the positions, an external line access request key. Each actuation of a request key temporarily opens the conversation line of the position and activates, in a call marker device, a called position marking output, or an external line request marking output. The conversation line of each position is connected to a call marker connecting circuit responsive to a closure of the line, a temporary opening thereof and the activation of a call marker output to which it is connected. A single one of a plurality of intercom connecting circuits is active, at any time, for authorizing the control from the call marker connecting circuits of as many intercom routing blocks connected thereto as there are positions. A plurality of external line connecting circuits are so chained that the first unoccupied one reached by an external line request is active for authorizing the control from the said marker connecting circuits of as many external line access blocks connected thereto as there are positions. Each position is provided with a visual display of the occupancy conditions of the positions and a total occupancy of the external lines.

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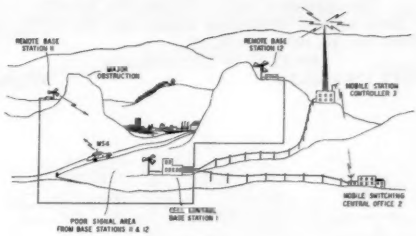
**3,819,872**

## MOBILE TELEPHONE CELLULAR SWITCHING SYSTEM

**Harold Escar Hamrick, Columbus, Ohio, assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.**

**Filed July 10, 1972, Ser. No. 270,499**
**Int. Cl. H04q** *7/04*
**U.S. Cl. 179—41 A** **24 Claims**


REMOTE BASE STATION II
REMOTE BASE STATION I2
MAJOR OBSTRUCTION
MOBILE STATION CONTROLLER 3
MOBILE SWITCHING CENTRAL OFFICE 2
POOR SIGNAL AREA FROM BASE STATIONS II & I2
CELL CONTROL BASE STATION 1

A high capacity cellular mobile communication system arranged to maintain a mobile station communication path by transferring the mobile station from a shadowed serving base station to a clear base station. A multiport trunk circuit is utilized to establish the communication path between a switching central office and the mobile station through a serving base station. The deterioration of the serving base station radio carrier communication link, brought about by the shadowing of the serving base station, enables the trunk circuit to test continuity of communication channels through other base stations to the mobile station. Once continuity of a new communication channel has been established through a clear base station, the trunk transfers the communication path to the tested communication channel in order that a continuous communication path may be maintained between the switching central office and the mobile station.

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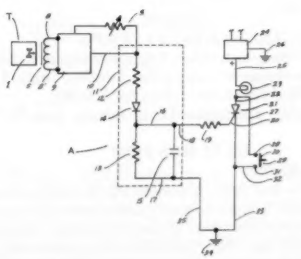
**3,819,873**

## TELEPHONE CALL INDICATOR

**Richard B. Stockton, 27 Thorndell, St. Louis County, Mo. 63124; Roger A. Hunter, Brighton, Ill., and Milton G. Croy, Lemay, Mo., assignors to said Stockton, by said Croy and Hunter**

**Filed May 2, 1972, Ser. No. 249,529**
**Int. Cl. H04m** *1/26, 1/00*
**U.S. Cl. 179—84 L** **1 Claim**



A telephone call indicator comprising an induction pickup coil for receiving a signal from a telephone set, means for am-

plifying said signal, a normally open latching switch in circuit with a visual signal and a power supply, and means for applying the amplified signal for closing said latching switch to effect energization of said visual signal, and a manually operated switch for resetting the device.

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### 3,819,874
### DATA RECORDING AND REPRODUCING SYSTEM

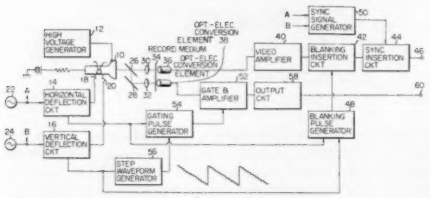
**Yoshio Fujio, Kyoto, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 191,243, Oct. 21, 1971, abandoned. This application Aug. 3, 1973, Ser. No. 385,472**

**Claims priority, application Japan, Oct. 30, 1970, 45-95750; Nov. 26, 1970, 45-104259**

**Int. Cl. G11b** *7/02*; **H04n** *5/84*

**U.S. Cl. 179—100.3 A** **5 Claims**




Gating pulses are incrementally delayed with respect to the associated horizontal blanking pulses for an electronic flying-spot scanner in response to successive vertical blanking pulses for the scanner to sample an audio signal to cause the samples to intensity modulate a flying spot on the scanner. The modulated flying spot progressively sweeps a record medium in the horizontal direction to record the samples of the signal into a matrix on the medium. The recorded samples are interlaced in the flying-spot scanning direction in which the rows of the matrix are arranged. Alternatively, with no gating pulse used, the modulated flying spot may progressively sweep a record medium in the vertical direction to record the audio signal on a plurality of spaced parallel tracks on the medium. Upon reproducing the scanner sweep the samples or tracks in the horizontal direction to reproduce the signal on the basis of the real time as if they would scan in the vertical direction at a low rate.

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### 3,819,875
### AIDS FOR DEAF PERSONS

**Max Leopold Velmans, London, England, assignor to National Research Development Corporation, London, England**

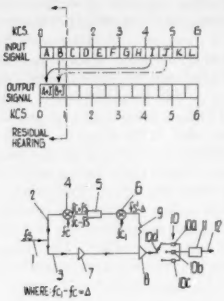
**Filed June 5, 1972, Ser. No. 259,381**

**Claims priority, application Great Britain, June 8, 1971, 19476/71**

**Int. Cl. H04r** *25/00*

**U.S. Cl. 179—107 FD** **9 Claims**

An aid for a deaf person, comprising means for changing electrical signals having a first range of electrical frequencies corresponding to a first range of audio frequency signals used in normal speech into electrical signals having a second range of electrical frequencies different from said first range of electrical frequencies in such a manner that the frequency differences of said first range of electrical frequencies are substantially maintained in said second range of electrical frequencies and for superimposing the changed electrical signals onto electrical signals having frequencies within said




second range of electrical frequencies and which correspond to a second range of audio frequency signals used in normal speech.

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### 3,819,876
### LOUDSPEAKER WITH IMPROVED VOICE COIL SUPPORT

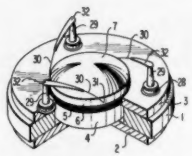
**Shouzo Kinoshita, Tokorozawa, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan**

**Filed Sept. 5, 1972, Ser. No. 286,527**

**Claims priority, application Japan, Sept. 4, 1971, 46-80326; Sept. 4, 1971, 46-80327; Sept. 4, 1971, 46-80328; Sept. 4, 1971, 46-80329**

**Int. Cl. H04r** *9/04*

**U.S. Cl. 179—115.5 VC** **7 Claims**

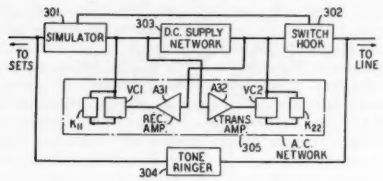


A loudspeaker comprising a voice coil bobbin with a voice coil wound around its periphery is disposed in an annular gap formed between a columnar pole and a plate surrounding said pole. A plurality of terminals are mounted on the plate so that they are distributed on the circumference of a circle concentric with respect to the axis of said bobbin and mounted rotatably about their respective axes which are in parallel with the axis of said bobbin, with the terminals being coupled through suspension wires to the bobbin. The suspension wires may be of high resiliency, and have a layer of viscous resilient material surrounding the same. The voice coil bobbin of a loudspeaker may comprise a cylindrical body with a voice coil wound around its periphery, plural turns of a heat-resisting ribbon member impregnated with the thermosetting adhesives provided around the cylindrical body with the voice coil strip metal pieces inserted in between turns of the ribbon around the cylindrical body and aligned in the circumferential direction with a certain spacing left between respective ones so that both ends of each strip metal piece, project from the side edges of the ribbon, wherein projecting ends of the strip metal pieces are folded as to lie on the ribbon outer turn and these folded portions are heated to harden the thermosetting adhesives to fix the metal pieces to the ribbon.

## 3,819,877
## CENTRALIZED NETWORK FOR A TELEPHONE STATION SYSTEM

**Donald Edgar Blahut, Bloomfield, N.J.; Stanley Joel Friedman, Indianapolis, Ind., and Donald Henry Nash, Colts Neck, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed Dec. 10, 1971, Ser. No. 206,692**
**Int. Cl. H04b** *3/36*
**U.S. Cl. 179—170 R** **10 Claims**

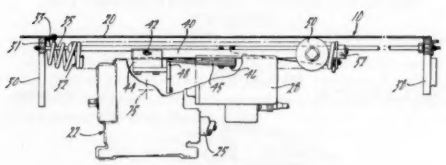



In a telephone station system the telephone apparatus is divided into two portions, a centralized network and one or more extensions or sets. The network is connected between the telephone sets and the line and may include, for example, a hybrid, amplifiers, automatic gain control circuitry and lightning protectors — all of which are shared by the satellite sets. The sets preferably include only the minimum required components such as a transmitter, a receiver, associated amplifiers, a tone ringer sounder and driver, and a dial.

## 3,819,878
## TRANSMISSION TEST SET FOR TELEPHONE CIRCUIT DATA COMMUNICATION SYSTEMS

**Buddie J. Pine, Palo Alto, and John R. Carter, San Jose, both of Calif., assignors to Antekna, Inc., Mountain View, Calif.**

**Filed Dec. 18, 1972, Ser. No. 316,017**
**Int. Cl. H04b** *3/46*
**U.S. Cl. 179—175.3 R** **12 Claims**

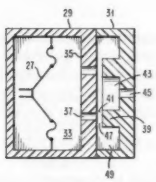


A transmission test and apparatus for automatically detecting a fault in a telephone circuit data communications system and for automatically sequencing through various tests for isolating the fault. Test sets are provided at each end of the data communication circuit and cooperate to automatically test both modems and the telephone circuit between them as well as performing additional tests on the test sets themselves and on the entire communications systems. Each test set contains a pseudo-random test pattern generator and receiver. Housekeeping status and command messages are transmitted between test sets by way of two frequency tones and by a digital message that is inserted periodically into the pseudo-random test pattern in a manner to be discriminated therefrom.

## 3,819,879
## ELECTRO-ACOUSTIC TRANSDUCER HOUSING ADAPTED FOR TELEPHONIC PCM COMMUNICATION SYSTEMS

**Werner Baechtold, Thalwil, Switzerland, assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed Nov. 13, 1972, Ser. No. 306,258**
**Claims priority, application Switzerland, Dec. 20, 1971, 1869/71**
**Int. Cl. H04m** *1/02*
**U.S. Cl. 179—179** **7 Claims**

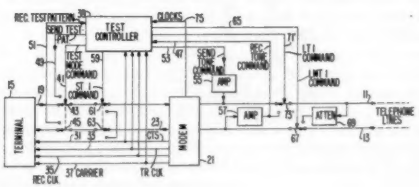



A telephone receiver handset includes a cover with a built-in structural acoustic Helmholtz resonator forming a low pass acoustical filter integral with the cover when applied to the capsule for the electro-acoustic transducer.

## 3,819,880
## POWER CONNECTING APPARATUS FOR MOVABLE MEMBERS

**Paul R. Johnston, Lancaster, Ohio, assignor to Diamond Power Specialty Corporation, Lancaster, Ohio**

**Filed Aug. 1, 1973, Ser. No. 384,465**
**Int. Cl. H02g** *11/00;* **A47l** *5/12*
**U.S. Cl. 191—12 R** **6 Claims**



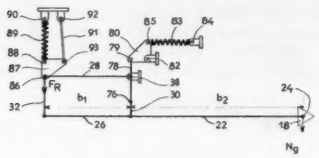

A helically coiled flexible electrical conductor extensible and retractable axially to provide electrical connection to a movable element is slidably supported by a rod which extends through it, one end of the coil being fixed and the other end movable. A tube slidably fitted on the rod extends from the movable end through convolutions of the coil and is movable with the movable end of the coil. A knob carried by the rear end of the tube controls the escape of convolutions from the tube during forward movement.

3,819,881

## ARTICULATED PARALLELOGRAM SUPPORT MECHANISM FOR CONNECTING A CURRENT COLLECTING HEAD TO A HIGH SPEED VEHICLE

Daniel Laurent, Grenoble, France, assignor to Societe Dauphinoise Flectrique, Grenable, France

Filed Mar. 21, 1972, Ser. No. 236,408
Int. Cl. B60l 5/00
U.S. Cl. 191—66 10 Claims



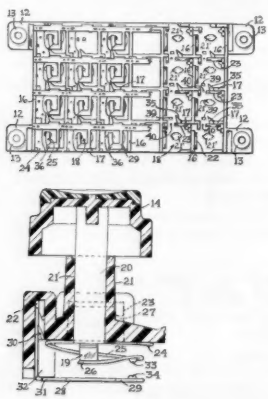
An articulated parallelogram mechanism for connecting a current collecting head to a high speed vehicle. Spring means maintain the collector head substantially in neutral equilibrium whatever may be the deviation of the collector head from its mean position with respect to the vehicle.

3,819,882

## MATRIX KEYBOARD ASSEMBLY

Fred N. Anderson; Michael F. Bedocs, and Eric L. Long, all of Waukegan, Ill., assignors to Cherry Electrical Products Corporation, Waukegan, Ill.

Filed Mar. 8, 1973, Ser. No. 339,351
Int. Cl. H01h 13/52, 9/00
U.S. Cl. 200—1 R 6 Claims



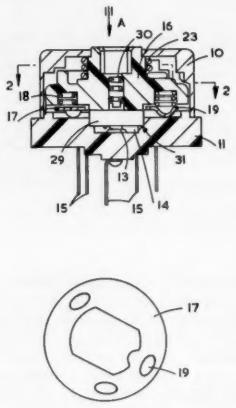
A matrix keyboard for use with electronic equipment having a one-piece molded base providing on its upper surface a series of hollow upstanding projections through which slidably project the actuator stems of a plurality of actuating keys. The underside of the base provides a series of switching compartments including structure for receiving in a fixed relation one to another as well as to the free end of the actuator stem, an array of current-conducting strips. One strip provides the movable switch blade, while the other strip extending in spaced transverse relation to the first strip, provides the fixed terminal contact.

3,819,883

## AUTOMOTIVE ROTARY SWITCH WITH INTERMEDIATE TIME DELAY MEANS BIASING A CONTACT IN NON-OPERATIVE POSITION

Alec John Heap, Burnley, England, assignor to Joseph Lucas (Electrical) Limited, Birmingham, England

Filed Oct. 27, 1972, Ser. No. 301,511
Claims priority, application Great Britain, Nov. 12, 1971, 52633/71
Int. Cl. H01h 21/62, 27/00
U.S. Cl. 200—11 J 5 Claims



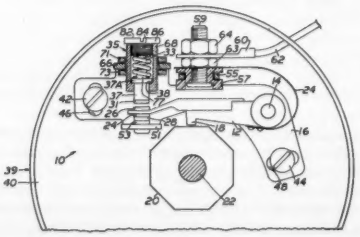
An electric switch including a body carrying a set of first contacts and second and third contacts. A rotor is mounted in the body and carries a first contact element for bridging selected first contacts during rotational movement of the rotor. The rotor further carries in a slot a second contact element in the form of a roller which is angularly movable with the rotor and also movable angularly relative to the rotor within the slot. A spring biasses the roller against a portion on the body carrying a pair of recesses. In one angular position of the rotor, the roller is aligned with the recesses and is urged by the spring to enter the recesses and bridge the second and third contacts. A torsion spring urges the rotor out of the said one angular position.

3,819,884

## MULTIPLE CONTACT IGNITION INTERRUPTER ASSEMBLY

John Janci, 1125 N. Karlov Ave., Chicago, Ill.

Filed Dec. 13, 1972, Ser. No. 316,262
Int. Cl. H01h 19/62
U.S. Cl. 200—27 A 4 Claims



An ignition interrupter adapted to cause a succession of a pair of sparks for each gas charge in each cylinder of an inter-

nal combustion engine, includes an arm pivotally mounted on a mounting plate, a stationary contact mounted on the plate at the front side of the arm, a first movable contact mounted on the front side of the arm opposite the stationary contact, a second movable contact mounted on the rear side of the arm and electrically connected to the first movable contact, a third movable contact positioned opposite the second movable contact to the rear of the arm and slidably mounted within a housing fixed to the mounting plate, the third movable contact being electrically connected to the stationary contact, a cam rotatably mounted on the plate, and a finger mounted on the front side of the arm for following the cam to cause the arm to pivot reciprocatively forwardly and rearwardly so that the stationary contact and the first contact are caused to engage electrically to cause the production of a first spark during a forward motion of the arm and the second and third contacts are caused to engage electrically to cause the production of a subsequent spark during a rearward movement of the arm. A first spring fixed to the mounting plate urges resiliently the finger forwardly into engagement with the cam, and a second spring mounted within the housing urges resiliently the third movable contact forwardly into a forward position to abut the second contact during the rearward motion of the arm, the cam being arranged to continue to drive the arm against the force of the second spring after the second contact engages the third contact.

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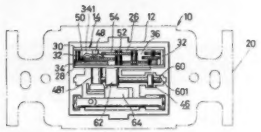
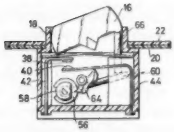
**3,819,885**

## TIME DELAY SWITCH DEVICE

**Kaoru Moroto, and Isao Suzuki, both of Nagoya, Japan, assignors to Zenkosha Tokie Kabushiki Kaisha, Aichi Prefecture, Japan**

**Filed Dec. 14, 1972, Ser. No. 315,190**
**Claims priority, application Japan, Dec. 16, 1971, 46-102382**
**Int. Cl. H01h** *7/08, 43/00*
**U.S. Cl. 200—35 R** **6 Claims**




A time delay switch device using a mechanical clock means consisting of a spiral spring and gearings. The actual on or off operation takes place by actuating a switch button but with a given time delay from the actuation.

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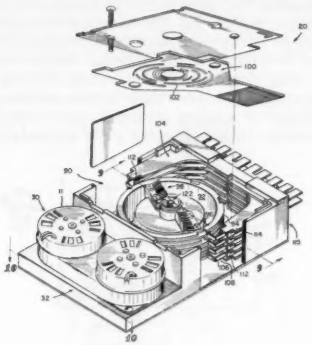
**3,819,886**

## CAM-OPERATED TIMER WITH ROTARY SWITCH MEANS INCLUDING MOVABLE CONTACTS ON THE CAM

**William N. Homan, Plainfield; Maurice E. Schuder, Indianapolis, and Richard W. Stafford, Clayton, all of Ind., assignors to P. R. Mallory & Co. Inc., Indianapolis, Ind.**

**Continuation-in-part of Ser. No. 69,257, Sept. 3, 1970, abandoned. This application July 24, 1972, Ser. No. 274,490**
**Int. Cl. H01h** *43/10*
**U.S. Cl. 200—38 B** **17 Claims**

The program means of a timing mechanism includes cam means and template means and electrical switching means to operate an appliance, the electrical switching means including mechanical switches responsive to the cam means and electrical shorting means responsive to the template means to cooperate with electrical conductive paths. Various drive means, as well as other features, are included.

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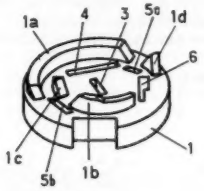
**3,819,887**

## ELECTRIC MULTI-POSITION SWITCH

**Paul Lipschutz, Croissy S/Seine, France, assignor to Societe d'Exploitation des Brevets Nieman, Neuilly, France**

**Filed Jan. 22, 1973, Ser. No. 325,266**
**Claims priority, application France, Mar. 29, 1972, 72.10948**
**Int. Cl. H01h** *27/00*
**U.S. Cl. 200—44** **10 Claims**




A multi-position electric switch device adapted to be associated in particular with a vehicle anti-theft device and having at least four positions, respectively STOP, ACCESSORIES, RUN, STARTER, comprising an interconnecting rotor and stationary conducting contact elements carried by an insulating stator and connected respectively to the various circuits to be connected or to be disconnected, wherein the improvement consists in that the said rotor is provided with a single conducting plate having two tongues of unequal lengths in the arrangement adapted to come into direct contact with the said stationary contact elements.

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**3,819,888**

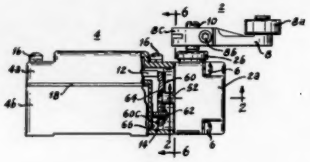
## LIMIT SWITCH MECHANISM

**Eugene F. Duncan, Milwaukee, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Ill.**

**Filed Feb. 26, 1973, Ser. No. 335,881**
**Int. Cl. H01h** *3/16*
**U.S. Cl. 200—47** **10 Claims**

A limit switch operating head subassembly mountable at its mating surface onto a switch subassembly in any one of a

number of different angular positions and may be detached without any parts falling out. The operating head subassembly has an operating arm pivotable in opposite directions for switch actuation. This operating arm is secured to a shaft that operates cams, rockers and slide members to operate an actuating plunger through a presettable mechanism allowing by-pass in one direction. The slide members are internally compression spring biased threaded members allowing stepless length adjustment. The presettable bypass mechanism has a flanged plunger on a square pin and a notch in the flange to allow presetting the plunger notch at 90° intervals for switch



operation in both directions or by-pass in one direction of operating arm movement. The operating shaft has a seal design that enhances sealing effect under fluid pressure and is smaller so as to use less material. An adjustable coupling mechanism transmits the plunger motion to the contact actuator. The stepless length adjustment of the slide members and the adjustment of the coupling mechanism afford adjustment of the plunger and coupling mechanism motions relative to the mating faces of the operating head and switch subassemblies, respectively, to afford presetting of the switch trip point at five degrees of arm movement.

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**3,819,889**

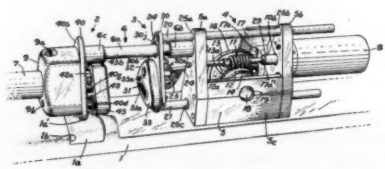
## HIGH VOLTAGE TRANSFER SWITCH

**Charles P. Majkrzak, Nutley, and Stephen F. X. Sladowski, Bayonne, both of N.J., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.**

**Filed Jan. 29, 1973, Ser. No. 327,266**

**Int. Cl. H01h** *31/00*

**U.S. Cl. 200—48 R** **24 Claims**



There is disclosed a high voltage, r.f., multi-contact switch assembly capable of sustained reliable operation in a severely space-restricted environment even when subjected to at least one steep voltage gradient in addition to that existing directly across the switch gap, which secondary voltage gradient arises from unrelated equipments arranged closeby. The entire arrangement is designed, and the various elements thereof individually possess a design shape and composition, to relieve electrical stress and prevent high voltage creepage and corona discharge. To this end, a stationary subassembly and a corresponding rectilinearly movable subassembly are maintained always in substantially a parallel plate arrangement, each subassembly having a corona shield which houses a matable contact block arrangement, the front surface of the corona shield providing the parallel plate engaging surfaces. One of the corona shields is spring-mounted for backwards discplacement of predetermined amount upon engagement of the switch subassemblies, which backward movement bares its plurality of contacts for engagement with those of the other subassembly. A single across-the-gap structural member is provided to ensure stability and alignment of the switch, which member is constructed of a teflon-jacketed, silicone-bonded fiberglass cylinder capped at each end by corona shields. The assembly rests on a base of silicone-bonded fiberglass and supports in place the stationary or "hot-side" subassembly in a special rounded-edge relationship designed to further distribute electrical stress.

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**3,819,890**

## EXPLOSION CIRCUIT BREAKER

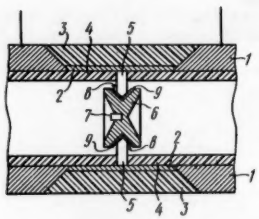
**Konstantin Isaakovich Kozorezov, Universitetsky prospekt, 21, korp. 1, kv. 29; Vitaly Vasilievich Semchenko, ulitsa 26 Bakinskikh Komissarov, 8, korp. 3, kv. 32; Viktor Vasilievich Biteryakov, ulitsa Vvedenskogo, 7, kv. 98; Georgy Ivanovich Mikhailu, ulitsa Volgina, 23, korpus 1, kv. 52, and Ninel Fedorovna Skugorova, ulitsa Bolshaya Cheremushkinskaya, 57, korp. 30, kv. 23, all of Moscow, U.S.S.R.**

**Filed May 18, 1972, Ser. No. 254,679**

**Claims priority, application U.S.S.R., May 25, 1971, 1659499**

**Int. Cl. H01h** *39/00*

**U.S. Cl. 200—61.08** **3 Claims**



An explosion type circuit breaker incorporating a hollow current-carrying bus containing an explosive charge and detonator characterized in that the current-carrying bus is provided with dielectric sheathings covering outer and inner surfaces of the hollow current-carrying bus, the dielectric sheathing covering the inner surface of the current-carrying bus having an annular groove and the explosive charge having an annular cumulative recess lined with a dielectric and facing the above-mentioned annular groove of the dielectric sheathing.

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**3,819,891**

## PUSH BUTTON SWITCH

**Gerald K. Miller; Dale L. Bull, and Norman A. Rautiola, all of Reed City, Mich., assignors to Narton Corporation, Reed City, Mich.**

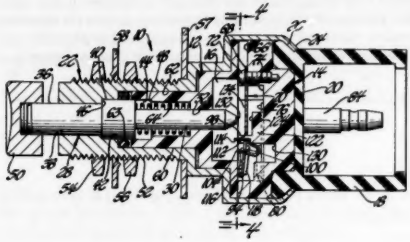
**Filed Aug. 25, 1972, Ser. No. 283,645**

**Int. Cl. H01h** *13/36*

**U.S. Cl. 200—67 D** **4 Claims**

A push button type electrical switch assembly has reparable body sections defining therebetween a chamber containing spaced fixed electrical contacts and spaced moveable electrical contacts carried by an arm which is resiliently restrained from moving the moveable contacts toward the fixed electrical contacts when as associated plunger-like actuator is

depressed against the arm; after sufficient force is applied to the arm via the actuator the resilient resistance to the move-



ment of the arm is overcome and the moveable contacts are permitted to snap into engagement with the fixed electrical contacts.

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**3,819,892**

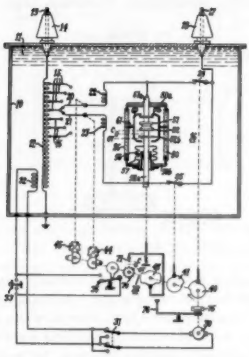
**FAIL SAFE VACUUM TYPE CIRCUIT INTERRUPTER AND ASSOCIATED LOAD CURRENT TAP CHANGER FOR ELECTRIC INDUCTION APPARATUS**

**William H. Rathbun, Pittsfield, Mass., assignor to General Electric Company**

**Filed Nov. 30, 1972, Ser. No. 310,908**

**Int. Cl. H01h** *33/66*

**U.S. Cl. 200—144 B** **2 Claims**



A load current tap changer for electric power transformers includes a vacuum type arcing-duty current interrupter immersed in dielectric fluid and biased to closed position by differential pressure. Overtravel limit switch means is actuated to shunt the vacuum arc gap upon excessive contact separation due to loss of vacuum and contact bias force. Limiting contact overtravel also disables the tap selector driving means.

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**3,819,893**

**AUXILIARY CONTACT MEANS FOR A CIRCUIT BREAKER**

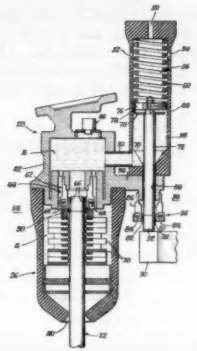
**Melbourne G. Jawelak, and Richard R. Boni, McMurray, both of Pa., assignors to McGraw-Edison Company, Elgin, Ill.**

**Filed July 26, 1972, Ser. No. 275,333**

**Int. Cl. H01h** *33/12*

**U.S. Cl. 200—146 R** **6 Claims**

Auxiliary contact means for a circuit breaker are provided and include an auxiliary movable contact and an auxiliary stationary contact comprising a member projecting from the main stationary contact. The auxiliary movable contact comprises part of an auxiliary contact opening means. The auxiliary contact opening means also serves as arc extinguishing means for the main contacts of the circuit breaker and this combination means is supported on the projecting auxiliary



stationary contact member. The main contact and the auxiliary contacts are arranged such that the auxiliary contacts open prior to opening of the main contacts so that the auxiliary contact current is transferred to the main contacts and the auxiliary contacts do not interrupt current. The auxiliary contacts also close after the main contacts so that a closing arc is not struck between the auxiliary stationary and movable contacts.

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**3,819,894**

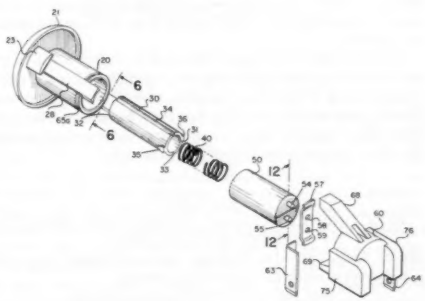
**ROTARY SWITCH WITH LINEAR PLUNGER AND HELICAL MOTION TRANSFERRING MEANS**

**Dennis P. Flumignan, Sterling Heights, and William J. Flanigan, Pontial, both of Mich., assignors to Gulf & Western Industries, Inc., New York, N.Y.**

**Filed Mar. 7, 1973, Ser. No. 338,861**

**Int. Cl. H01h** *19/14, 3/12*

**U.S. Cl. 200—156** **6 Claims**



An electric switch particularly useful on an appliance such as a refrigerator, freezer, oven or the like, for controlling internal illumination is provided. The switch may be a door frame mounted device. Internal components convert a telescoping thrust drive, initiated by closure of the door, for example, into rotational movement of one of the telescopic components. The rotating component drives a stepped contact rotationally so as to make or break an electric circuit or path between the terminal contacts of the switch. The interval

terminal contacts of the switch are contact pads and the rotational movement of the stepped contact makes wiping or scrubbing contact with the contact pads thereby cleaning the contact surfaces of the contact pads when physical and electrical contact is made.

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**3,819,895**

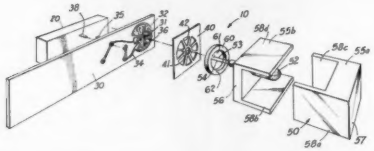
## ELECTRONIC MOMENTARY SWITCH

**Clarence E. Pittman, Atlanta, and Ivan H. Crim, Chamblee, both of Ga., assignors to Lectradate, Inc., Atlanta, Ga.**

**Filed Oct. 4, 1972, Ser. No. 295,004**

**Int. Cl. H01h** *13/52, 1/02, 1/06*

**U.S. Cl. 200—159 B** **5 Claims**



An electronic momentary switch operable for initiating current flow in solid state circuit means in response to movement of depressible switch button means. The electronic momentary switch means includes circuit means electrically connected to the solid state circuit means. The electrical circuit means includes a number of space conductive contacts detailed in location to normally prevent current flow, therethrough. Insulation means having a number of cut out openings corresponding to the number and location of the conductive contacts. A deformable conductive resilient elastromeric means is supported on the depressible switch button means and positioned above the openings in the insulation means whereby depressing movement of the switch button means will deform the conductive resilient means, such that the conductive resilient means is deformed through the openings in the insulation member and into contact with the conductive contacts, whereby electrical current can flow through the spaced contacts for biasing the solid state circuit from an off non-current conducting condition to an on, or momentarily closed, current conducting position. The switch button means is constructed of a clear transparent housing and includes light mounted therein, with the light being illuminated in response to movement of the solid state circuit means to an on current conducting position.

In the second embodiment the switch is shown with a plurality of circumferentially spaced terminals which are closed or shunted momentarily, operating with an alphanumeric indicator, such as light emitting diodes or Nixie tubes. By selection of the arrangement of the apertures in an insulation sheet, selective lighting of the indicator is provided.

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**3,819,896**

## ELECTRICAL SWITCHING DEVICE AND CONTACT SPRING SET THEREFOR

**Martin Aidn, and Alois Ruhland, both of Munich, Germany, assignors to Siemens AB, Berlin, Germany**

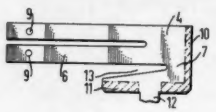
**Filed Apr. 12, 1973, Ser. No. 350,319**

**Claims priority, application Germany, Apr. 17, 1972, 2218495**

**Int. Cl. H01h** *1/28*

**U.S. Cl. 200—166 J** **9 Claims**

Mounting for contact springs of an electrical switching device. The springs are mounted at their inner ends in an insulating base member for the switching device and are freely movable at their free ends to alternately engage or disengage a stationary contact upon operation of an actuator for the springs. The mounting for each spring includes a stable flexing leg extending across the inner end of the spring and mounted in the base for the switch and having a right-angled portion extending parallel to the spring and mounted in a right-angled portion of the base for the switch. The stable flexing leg has a terminal extending therefrom through a window in the right-angled portion of the base. The stationary contact is mounted to extend between the contact springs and is flexible to a limited extent and fixed to an extension of the insulating base



at its rear end and along one side of said contact. The stationary contact is diagonally slit in a longitudinal direction along the support portion of the base extending parallel to the contact, to accommodate a limited flexing of said stationary contact and may be drilled to vary the flexibility thereof and provide the required elasticity of said contact, and determine the bending point thereof.

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**3,819,897**

## VACUUM SWITCH WITH CONTACT MATERIAL CONTAINING A MINOR PERCENTAGE OF ALUMINUM

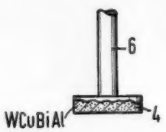
**Gerhard Peche, and Hans Bettge, both of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Berlin, Munich, Germany**

**Filed Jan. 22, 1973, Ser. No. 325,613**

**Claims priority, application Germany, Jan. 21, 1972, 2202924**

**Int. Cl. H01h** *1/02*

**U.S. Cl. 200—263** **7 Claims**




A vacuum switch having a pair of contact elements which are movable together characterized by the material of the contact elements containing an alloy of a metal with a high electrical conductivity, a metal which counteracts welding, and aluminum in an amount up to 1 percent by weight. In the preferred embodiments, the contact element is preferably made from a body of porous sintered tungsten which has pores that are impregnated with the alloy which comprises a copper alloy containing 0.5 to 1 percent by weight bismuth and 0.2 to 0.4 percent by weight aluminum.

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**3,819,898**

## ADJUSTABLE SCARFING TOOL

**Denis R. Boston, Livingston, Ill., assignor to Olin Corporation, New Haven, Conn.**

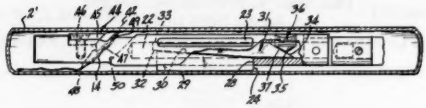
**Division of Ser. No. 246,307, April 21, 1972. This application June 29, 1973, Ser. No. 374,915**

**Int. Cl. H05b** *5/00*

**U.S. Cl. 219—8.5** **6 Claims**

An adjustable scarfing apparatus comprising an elongated body member supporting a cutting tool within a welded tube. In accordance with one embodiment, a plurality of slides are dispersed radially about the body and at least one of the slides is made continuously adjustable inwardly or outwardly from the body. In accordance with another embodiment, a cutting

tool having a circular cutting edge which may be indexed is employed with the plane of the cutting edge. The plane of the cutting edge is inclined at an angle of from about 30° to about 60° to the longitudinal axis of the tube. Alternatively, the apparatus may include both of these embodiments.



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**3,819,899**

## DOUBLE UNIT MICROWAVE OVEN HAVING AN ENERGY SEAL THEREBETWEEN

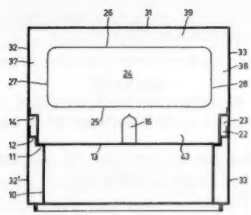
**Helge Frithiof Wallin, Norrkoping, and Leo Malmquist, Ektorp, both of Sweden, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Dec. 16, 1971, Ser. No. 208,599**

**Claims priority, application Sweden, Dec. 21, 1970, 17333/70**

**Int. Cl. H05b** *9/06*

**U.S. Cl. 219—10.55** **10 Claims**



A microwave oven consisting of two structural units, the first structural unit comprising the electrical components, including the magnetron, and the second unit comprising, inter alia the oven cavity. A quarter wave choke is formed at the area where both units are joined.

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**3,819,900**

## WAVEGUIDE FILTER FOR MICROWAVE HEATING APPARATUS

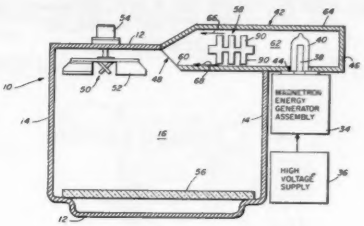
**Richard Ironfield, Williamsburg, Iowa, assignor to Amana Refrigeration, Inc., Amana, Ill.**

**Continuation-in-part of Ser. No. 262,396, June 13, 1972, Pat. No. 3,758,737. This application June 4, 1973, Ser. No. 366,945**

**Int. Cl. H05b** *9/06*

**U.S. Cl. 219—10.55** **3 Claims**

A low pass filter is provided for rectangular waveguide of the type employed for launching electromagnetic energy in microwave ovens. The filter substantially rejects the transmission of harmonic frequencies of the fundamental generator operating frequency as well as higher order waveguide modes such as the $TE_{20}$, $TE_{30}$ etc. The structure described has a corrugated configuration with ribs defining alternate cavities and constrictions having cutoff frequency characteristics. Each of the ribs are slotted to substantially suppress such higher order modes of the harmonic frequenices particularly the second harmonic. The structure is spaced from the broad rectangular waveguide walls to define two propagation paths for the electromagnetic energy. Lightweight conductive materials may be utilized. Rib structure is symmetrically disposed on opposing sides of a reference plane extending along the longitudinal axis of the waveguide.

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**3,819,901**

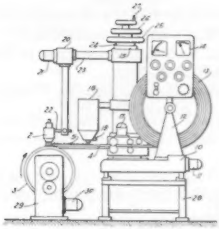
## WELDING PROCESS USING GRANULAR OR POWDER FILLER DELIVERED ON OPEN-CHANNEL STRIP

**Vasile Berinde; Adolf Million; Nicolae Greavu, and Carol Million, all of Bucharest, Romania, assignors to Institute De Cercetari Tehnologice Pentru Constructii De Masini, Soseaua, Romania**

**Filed Sept. 14, 1972, Ser. No. 289,065**

**Int. Cl. B23k** *9/04*

**U.S. Cl. 219—76** **1 Claim**

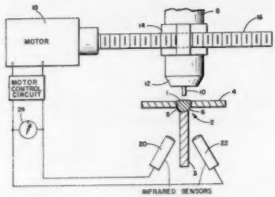


The invention relates to a surfacing process for metallic parts by applying to them layers constituted of special alloys, the component being melted in a plasma jet. In order to form a weld surfacing layer, a trough shaped metallic sheet strip receives by free fall powder or granular alloying materials, the strip being continuously pushed forward into the melting zone of a plasma jet, which simultaneously melts the basic material surface and the metallic strip and the powder or grains deposited on it, the ratio between the metal quantities resulting from the strip and from the powder or grains respectively, being adjusted by varying the trough shape and width. For obtaining weld surfacing layers with required geometrical parameters and chemical composition which can be adjusted within large limits, a mechanized outfit is used, consisting of a carriage on which are placed a support for the strip coil, a rotating column, a shaping device driven by an electric motor, a container with shutter for the storage of alloying powders or grains, an oscillating mechanism driven by an electric motor provided with two adjustment arms, three handles for the control of the shaping machine, container and plasma torch and a runway on which the carriage is shifted. Besides these exist electric current, protection gas and cooling water feeding units and a control panel.

## 3,819,902
## PATTERN WELDING CONTROL DEVICE

Paul R. Sidbeck, Torrance, and Daniel S. Weinstein, Palos Verdes Peninsula, both of Calif., assignors to North America Rockwell Corporation, El Segundo, Calif.

Division of Ser. No. 185,995, Oct. 4, 1971, abandoned. This application June 8, 1973, Ser. No. 368,543
Int. Cl. B23k 9/00
U.S. Cl. 219—125 PL 15 Claims

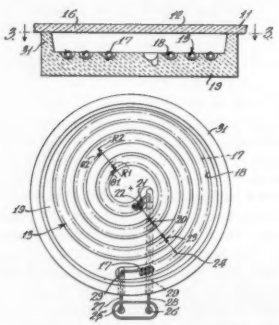



An arc-seam welding procedure to join two thin sheets in 'T' relationship wherein two infrared sensors disposed on opposite sides of the vertical member detect any welding puddle heat unbalance from the underside. An unbalance signal from the sensors moves the welding heat source transversely across the puddle during its progressive movement along the joint, to restore the heat balance on the other side of the joint. The arangement avoids the need for costly chill bars, and is especially suitable where the vertical member is corrugated or sinusoidal in plan view.

## 3,819,903
## CERAMIC COOKTOP WITH A SPIRALLED HEATING COIL ELEMENT ASSEMBLY

Harold Louis Frick, Marion, Ohio, assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed June 28, 1973, Ser. No. 374,630
Int. Cl. H05b 3/68
U.S. Cl. 219—464 7 Claims

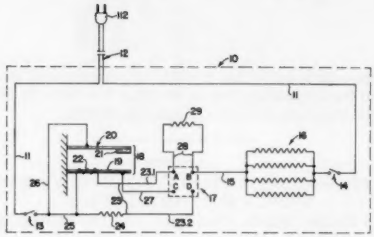


A smooth glass-ceramic cooktop for ranges and the like having one or more heating elements disposed below the cooktop for heating cooking utensils and the like supported on the cooktop. Each one of the heating elements is arranged in a unique spiral configuration providing substantially uniform heating of the cooktop surface area disposed superjacent thereto. The spacing between the spiral coil turns of the respective heating elements decreases as a function of the angle thereof from the inner end of the spiral in a novel manner to provide the desired uniform heating effect.

## 3,819,904
## CONTROL CIRCUIT FOR TIMED FOOD HEATING DEVICE

Edward P. Novak, North Canton, Ohio, assignor to The Hoover Company, North Canton, Ohio

Filed Mar. 16, 1973, Ser. No. 342,091
Int. Cl. H05b 1/02
U.S. Cl. 219—492 9 Claims

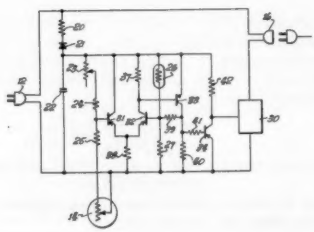


Control circuit for a timed food heating device such as an electric toaster having a heat-up, cool-down timer. The invention provides for selectively operating the device in a (1) normal, high-heat output mode for an operational cycle, in a (2) lower heat output mode for a somewhat longer operational cycle, or in a (3) low heat output mode during the initial portion of the operational cycle and a high heat output mode during the latter portion of such operational cycle.

## 3,819,905
## HEATER CONTROL SYSTEM

Richard M. Trostler, 1730 Woodbend Dr., Claremont, Calif. 91711

Filed Mar. 19, 1973, Ser. No. 342,522
Int. Cl. H05b 1/02
U.S. Cl. 219—501 5 Claims



A heater control system for water bed heaters, in which system temperature sensing circuitry with a temperature sensing element is packaged together with the power supply circuitry for the temperature sensing circuitry, heat sinks are provided to thermally isolate the temperature sensing element from heat given off the power supply circuitry and to also expose the temperature sensing element to the temperature of an adjacent water bed bladder, and electrostatic shielding is provided to avoid capacitative coupling between the sensing circuitry and an adjacent body of water, the water in a water bed bladder, the temperature sensing circuitry including a switch to supply power to a water bed heater at selected temperatures.

3,819,906

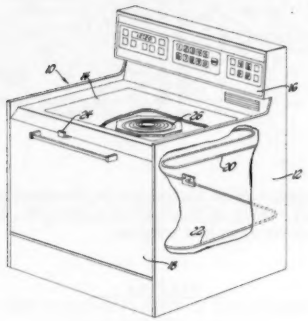
## DOMESTIC RANGE CONTROL AND DISPLAY SYSTEM

Robert R. Gould, Jr., Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 26, 1972, Ser. No. 318,172

Int. Cl. H05b *1/02*

U.S. Cl. 219—506 19 Claims



A domestic range including a touch control and display panel and digital control logic for energizing power circuits controlling the various range heater elements in response to a program entered by the user by touching certain areas of the panel. The control logic also controls the displays located behind the panel to provide feedback to the user of the program selected.

3,819,907

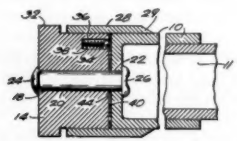
## GOLF SCORE GRIP FOR CADDY CARTS

Saul Faber, Milwaukee, Wis., assignor to Saul Faber Corporation, Milwaukee, Wis.

Filed Sept. 5, 1972, Ser. No. 285,988

Int. Cl. G06f *9/00*; G06c *1/00*; G06m *1/00*

U.S. Cl. 235—1 B 3 Claims



A golf score indicating device is integrally incorporated in the butt end of a caddy cart handle grip. The device includes a cylindrical counter drum which has numerals marked on its outer surface and which is rotatably attached to the end of the handle grip. A sleeve having a window therein is fixedly mountd over the counter drum with one numeral on the counter drum being visible through the window. The counter drum can be rotated to change the numeral which is visible through the window. In one embodiment, spring loaded detent ball which is mounted on the counter drum engages dimples in a detent plate attached to the counter sleeve for correctly aligning the numerals with respect to the window.

3,819,908

## MICROFICHE FILM SHEET DETECTION DEVICE FOR MICRO-READERS AND MICRO-PRINTERS

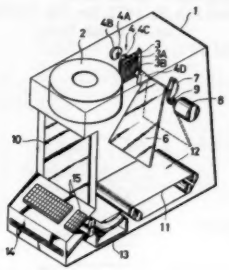
Takeshi Abe, Yokohama, Japan, assignor to Ricoh Co. Ltd., Tokyo, Japan

Filed Sept. 13, 1972, Ser. No. 288,558

Claims priority, application Japan, Sept. 14, 1971, 46-70919

Int. Cl. G06k *7/14*

U.S. Cl. 219—506 15 Claims



Disclosed is a microfiche film sheet detection device for micro-readers and micro-printers. A number of microfiche film sheets are stored in a storage case, and each is provided with indentifying coded symbols. The microfiche film sheets in the storage case are successively withdrawn to a detecting position, and a detecting means reads out successively the coded symbols of each withdrawn microfiche film sheet. The coded symbols which are thus read out are compared with a selected set of coded symbols to select a desired microfiche film sheet. A selected microfiche film sheet is further withdrawn to a position in which the information microfilmed thereon can be read out.

3,819,909

## CONTROL DEVICES

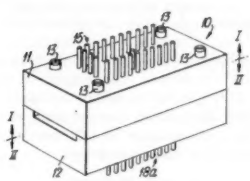
William Arthur Thompson, Sydney, New South Wales, Australia, assignor to Air Logic Pty. Limited, New South Wales, Australia

Filed Mar. 13, 1972, Ser. No. 234,353

Claims priority, application Australia, Mar. 22, 1971, 4384/71

Int. Cl. G06k *7/01*; G06d *3/00*; G06m *1/06*; G01d *5/34*; G01n *21/30*; G08c *9/00*; G06k *7/10*

U.S. Cl. 235—61.11 R 9 Claims



A sensor device comprising an array of energy delivery elements connectible with an energy source, and an array of energy receiver elements spaced therefrom with each energy delivery element being axially aligned with one of the energy receiver elements, and an apertured control element adapted to be passed between the arrays for selective registration between its apertures and certain ones of the energy delivery (and receiver) elements during relative passage thereof, the spaced relationship of the energy delivery/receiver elements and of the apertures within the control element being such

that, as the control element passes between the delivery and receiver orifices, a Vernier effect will occur whereby sequential registration will occur between successive ones of the receiver elements and successive ones of the apertures in the control element.

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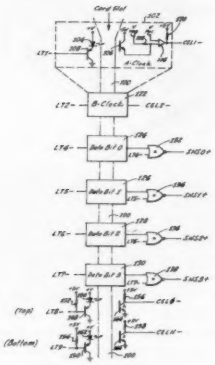
**3,819,910**
**OPTICAL CARD READING SYSTEM**
**John R. Scantlin, Los Angeles, Calif., assignor to Transaction Technology Inc., Los Angeles, Calif.**
**Filed July 31, 1972, Ser. No. 276,768**
**Int. Cl. G06k** *7/14*
**U.S. Cl. 235—61.11 E** **21 Claims**



An optical card reading system for reproducing coded information contained on a plurality of tracks on a card and with the information formed as discrete areas having a transmissivity different than an adjacent area while the entire card appears opaque to the naked eye and with the reading system including a plurality of light sources positioned to one side of the card and corresponding in number to the number of information tracks on the card and with a plurality of light-sensitive elements each of which produces an output signal in response to light energy passing through the card from the light source and with the light-sensitive elements corresponding in number to the number of light sources and with the individual light sources activated in sequence to direct light energy toward the card and with any output signals from the light-sensitive elements also gated in sequence to correspond to the corresponding light source so as to reduce spurious output signals. The card reading system also includes the light sources being energized in sequence to further reduce spurious output signals. The invention also includes the use of additional light sources and light-sensitive elements to read out additional information such as clocking information or information detecting the presence of the card at various positions.

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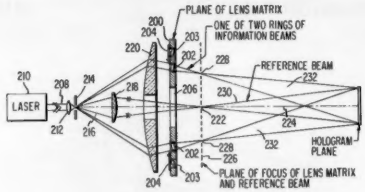
**3,819,911**
**IDENTIFICATION CARD DECODER**
**David Leslie Greenaway, Bassersdorf, Switzerland, assignor to RCA Corporation, New York, N.Y.**
**Filed Oct. 20, 1972, Ser. No. 299,295**
**Int. Cl. G06k** *7/10, 9/00, 19/08*
**U.S. Cl. 235—61.11 E** **13 Claims**

Cards employing a light-modifying portion containing doubly encoded numbers are responsive to the illumination thereof for deriving a binary encoded pattern of light spots lying respectively on the circumference of either of two concentric circles. By rotating the pattern about its center or by rotating the light sensing elements about an appropriate axis,


PLANE OF LENS MATRIX
ONE OF TWO RINGS OF INFORMATION BEAMS
REFERENCE BEAM
LASER
HOLOGRAM PLANE
PLANE OF FOCUS OF LENS MATRIX AND REFERENCE BEAM

solely two light sensors are required for decoding, regardless of the total number of bit positions of the code. The light-modifying portion may be a hologram.

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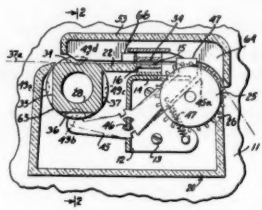
**3,819,912**
**PERFORATED TAPE READER**
**John D. Gearheart, Covina, and George Takenaka, Santa Ana, both of Calif., assignors to Addmaster Corporation, San Gabreil, Calif.**
**Filed May 10, 1973, Ser. No. 359,086**
**Int. Cl. G06k** *7/10;* **H04l** *15/20*
**U.S. Cl. 235—61.11 E** **8 Claims**



A perforated tape reader for different width tapes comprising a rotatable spool member having tape edge guide sections of different widths and locations arranged around the spool. A detenting device for the spool forms a second edge guide means for the tape at a point spaced from the spool. A dirt and light excluding cover, when closed, maintains the tape in tape guided position on the spool and on a feed sprocket.

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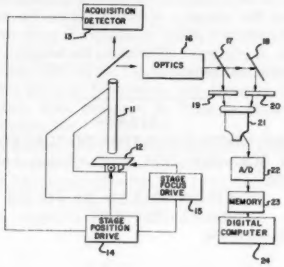
**3,819,913**
**DETECTION OF EOSINOPHIL CELLS ON A BLOOD SMEARED SLIDE**
**Charles N. Carter, and Burton H. Sage, both of Raleigh, N.C., assignors to Corning Glass Works, Corning, N.Y.**
**Filed May 21, 1973, Ser. No. 362,426**
**Int. Cl. G06m** *11/02*
**U.S. Cl. 235—92 PC** **10 Claims**

In an automated blood cell identification system a high resolution microscope and a split path optical system produce a blue filtered image and a yellow filtered image of an eosinophil blood cell. These images are converted into digital histo-

grams representing the optical density of points in each image. The histograms are compared one to the other. An eosinophil




cell is identified if the optical density of the histogram of the blue image is greater than the optical density of the yellow image.

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**3,819,914**

## DEVICE FOR THE FLIGHT GUIDANCE FROM A WIRELESS GUIDE BEAM

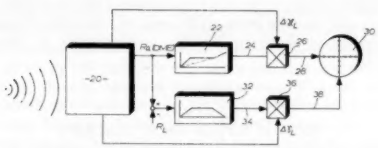
**Eugen Julius Bettinger, Friedrichshafen; Harmut Heiner Bohret, Uhldingen-Muhlhofen, and Gunther Schanzer, Uberlingen/Bodensee, all of Germany, assignors to Bodenseewerk Geratetechnik GmbH, Uberlingen/Bodensee, Germany**

**Filed May 17, 1973, Ser. No. 361,146**

**Claims priority, application Germany, Oct. 12, 1972, 2249979**

**Int. Cl. G06g** *7/78*

**U.S. Cl. 235—150.22** **5 Claims**



The on-board landing approach apparatus of an aircraft includes a computer between the landing receiver and the autopilot and/or the crosspointer instrument employed to direct the landing approach and utilizing two output signals. The computer includes a first function generator for modifying the slant distance signal in a predetermined manner; a first multiplying means for multiplying the so modified slant distance signal and the azimuth angle deviation signal to produce a first output signal; a second function generator for modifying, in a predetermined manner, the difference of the slant distance signal and a distance characteristic of the particular airport being approached; and second multiplying means for multiplying said modified difference signal and an altitude angle deviation signal to produce the second output signal.

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**3,819,915**

## METHOD AND APPARATUS FOR CONTROLLING THE CURE OF A RUBBER ARTICLE

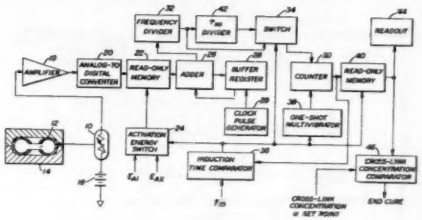
**Thomas W. Smith, Akron, Ohio, assignor to McNeil Corporation, Akron, Ohio**

**Filed Sept. 17, 1973, Ser. No. 398,541**

**Int. Cl. G06f** *15/46;* **B29h** *5/02*

**U.S. Cl. 235—151** **17 Claims**

Disclosed is an apparatus and method for controlling the cure of a rubber compound according to the cross-link concentration thereof. The method and apparatus recognizes that most cures can be divided into two distinct reaction periods, an induction period where little, if any, cross-linking of the molecular structure occurs and a cross-linking period where the majority of the chemical vulcanization reaction occurs, and controls the cure accordingly. Based on signals from a temperature sensitive probe embedded in the rubber, the induction time period is calculated using the Arrhenius equation and a known activation energy. This calculated induction time is compared to a predetermined value and upon a match, calculation of the percent cross-link concentration is initiated using a known activation energy and compared with a predetermined percentage cross-link value. When the rubber compound is cured to the desired percentage of cross-link concentration, the curing process can be terminated.

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**3,819,916**

## METHOD FOR MONITORING MACHINING CONDITION OF A MACHINE TOOL

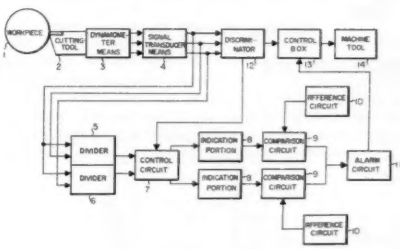
**Toshiaki Watanabe, Kasugai, Japan, assignor to Okuma Machinery Works, Ltd., Nagaya-shi, Japan**

**Filed Oct. 20, 1972, Ser. No. 299,561**

**Claims priority, application Japan, Oct. 22, 1971, 46-84263**

**Int. Cl. B23q** *11/00*

**U.S. Cl. 235—151.11** **5 Claims**

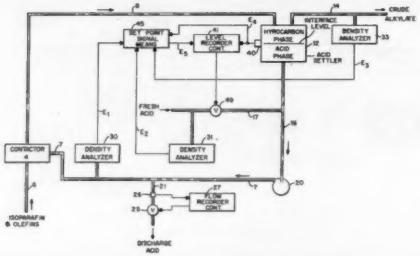



In a machine tool having a work holder and a cutting tool which is brought into cutting engagement with a workpiece held on the work holder to machine the same, the reaction force on the cutting tool is detected in the form of three components, that is, a backing force component, a feeding force component and a main force component, to obtain ratios of one component to the other two components. The ratios are then compared with corresponding reference values to detect abnormal conditions of the cutting tool.

## 3,819,917
## MEANS AND METHOD FOR CONTROLLING THE HYDROCARBON CONTENT OF RECYCLE ACID IN AN ALKYLATION UNIT

**Donald E. Sweeney, Jr., Beaumont, and Walker L. Hopkins, Houston, both of Tex., assignors to Texaco Inc., New York, N.Y.**

**Filed Aug. 16, 1972, Ser. No. 281,063**
**Int. Cl. C07c 3/52; G06g 7/58**
**U.S. Cl. 235—151.12** **9 Claims**

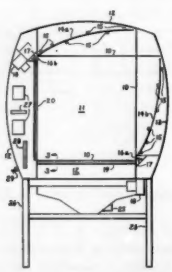



A control system and method controls the hydrocarbon of recycle acid in an alkylation unit to maintain a predetermined hydrocarbon content. The hydrocarbon content is controlled by controlling the interface level between the acid phase and the hydrocarbon phase in an acid settler in accordance with sensed densities of fresh acid entering the alkylation unit, crude alkylate provided by the acid settler in the alkylation unit and the recycle acid. A network substantially determines the actual hydrocarbon content of hydrocarbon enriched acid leaving the acid settler a portion of which is provided as the recycle acid, along with the fresh acid, to a contactor. In the contactor, an isoparaffin and an olefin are contacted with the acid to provide an acid-hydrocarbon mix to the acid settler. The settler provides the crude alkylate for further processing.

## 3,819,918
## ELECTRONIC DEVICE FOR DETERMINING THE HEIGHT, WIDTH, LENGTH AND VOLUME OF A CONTAINER

**Elgie J. Hale, Ogden, Utah, assignor to Kratos, San Diego, Calif.**

**Filed Mar. 19, 1973, Ser. No. 342,685**
**Int. Cl. G01b 11/00**
**U.S. Cl. 235—151.3** **3 Claims**

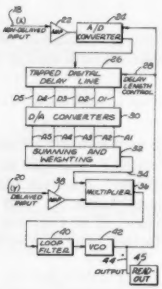


A device for measuring and recording the length, width, height, and volume of a container as it moves along a conveyor system comprises two rows of photo transistors upon which respective curtains of parallel light rays are directed. The container intersects a portion of each curtain of light as it moves along the conveyor, and an encoder means produces recurring signals corresponding to a preset increment of advancement of the container through the curtains of light. Each signal from the encoder activates means for counting the number of darkened photo transistors in each row thereof at that instant. A computer determines the height, width, length, and volume of the container.

## 3,819,919
## TRACKING SYSTEM FOR TIME-DISPLACED SIGNALS

**Richard D. McGunigle, 2501 W. Sunflower, Apt. L2, Santa Ana, Calif.**

**Filed Dec. 8, 1972, Ser. No. 313,226**
**Int. Cl. G06f 15/20, 15/34**
**U.S. Cl. 235—151.34** **8 Claims**

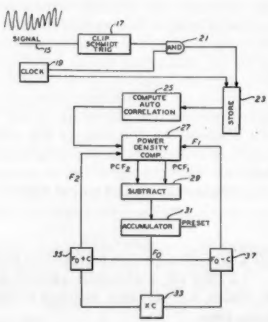



An automatic tracking correlator is disclosed for measuring the time delay between two input signals by crosscorrelation. Values of one signal are registered until a similar pattern is detected in the other signal. As disclosed, a simple, economical correlation circuit is utilized incorporating analog-digital converters and variable-delay shift registers. An embodiment of the system is disclosed for the measurement of flow or velocity.

## 3,819,920
## DIGITAL FREQUENCY TRACKER

**Lester I. Goldfischer, New Rochelle, N.Y., assignor to The Singer Company, Little Falls, N.J.**

**Filed Jan. 29, 1973, Ser. No. 327,596**
**Int. Cl. G06f 15/34; G01r 23/02**
**U.S. Cl. 235—152** **9 Claims**




A digital frequency tracker for a Doppler navigation system in which the input is sampled, autocorrelation functions values computed therefrom, and the values used in a Fourier series computation to obtain powers bracketing a center frequency.

From these computations tracking and acquisition is provided by shifting the center frequency as a function of the computation until equal power occurs on both sides of the center frequency. Also shown are means to compute altitude by sampling at the FM modulation rate.

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**3,819,921**

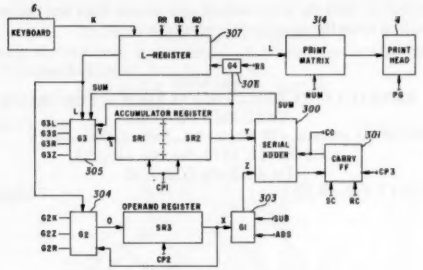
## MINIATURE ELECTRONIC CALCULATOR

**Jack S. Kilby; Jerry D. Merryman, and James H. Van Tassel, all of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.**

**Continuation of Ser. No. 143,192, May 13, 1971, abandoned, which is a continuation of Ser. No. 671,777, Sept. 29, 1967, abandoned. This application Dec. 21, 1972, Ser. No. 317,493**

**Int. Cl. G06f 7/38**

**U.S. Cl. 235—156** **59 Claims**




Binary-coded decimal electronic calculator capable of adding, subtracting, multiplying and dividing with some degree of automatic decimal point placement to provide a visual display of answers of up to 12 decimal digits. The decimal digits are serially displayed at a speed compatible with the calculator operations. The parts of the calculator are so adapted electrically and mechanically in relation to each other to result in a minature portable battery operated calculator of extremely small dimensions for example the outside case dimensions of 4¼ inches by 6⅛ inches by 1¾ inches and very low weight of about 45 ounces, having a calculating capability only before obtainable in calculators of much larger size and weight while retaining mechanical and operational simplicity. Some significant aspects of the calculator are the primary electronics embodied in an integrated semiconductor circuit array located in substantially one plane for performing the arithmetic calculations and generating the control signals, a keyboard input arrangement located in substantially one plane parallel to the integrated semiconductor circuit array for producing unique electrical signals corresponding to number and command entries and a visual display using a semiconductor array, as for a thermal printer for printout.

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**3,819,922**

## CRANE LOAD AND RADIUS INDICATING SYSTEM

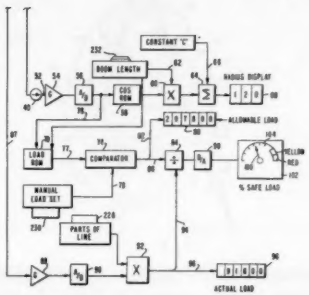
**Robert Horn, Richardson, and Raymond J. Slovacek, Dallas, both of Tex., assignors to Forney Engineering Company, Carrollton, Tex.**

**Filed May 2, 1973, Ser. No. 356,702**

**Int. Cl. G08b 21/00**

**U.S. Cl. 235—193** **25 Claims**

Separate modular units, including a main tensiometer, a boom angle transducer, a control logic module, a combined boom radius readout and a degree of safe load meter unit, and combined actual load and allowable load readout unit, are operatively connected to a boom-type crane. The units are electrically interconnected by suitable cables that are shielded and insulated from the crane. The control logic module contains a transistorized solid-state circuit that receives, amplifies, and converts analog signals from the boom angle transducer and from a selected one of the tensiometer units, to corresponding digital signals that are continuously and automatically processed with data read from a selected memory module in which information based on the configuration of the crane in use is stored. Digital signals are produced for use




in operating the digital radius readout, the allowable load readout, and the actual load readout, respectively, as well as digital signals corresponding to the ratio of the allowable loads. The resulting digital safe load signals are then converted to corresponding analog signals for use in operating the degree of safe load meter.

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**3,819,923**

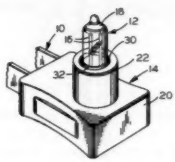
## SEAL OFF AROUND GE3952 LAMP

**Walter Carl Schumacher, Warwick, R.I., assignor to General Electric Company, New York, N.Y.**

**Filed Feb. 6, 1973, Ser. No. 330,080**

**Int. Cl. F21v 21/08**

**U.S. Cl. 240—1 R** **5 Claims**




A plug in guide light is provided having a molded thermoplastic body, and having power blades and a glow lamp extending from and supported by the body. The power blades are parallel to each other and generally normal to the axis of the glow lamp. The support of the lamp is improved and the extrusion of flash around the lamp is restricted by formation of an annular well in the body at the base of the glow lamp.

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**3,819,924**

## LAMP

**Wesley L. Thomas, 109 S. Catalina, Los Angeles, Calif. 90004, and James Allan Thomas, 861 Willow Dr., Brea, Calif. 92621**

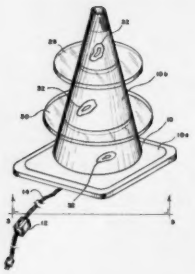
**Filed Apr. 30, 1973, Ser. No. 355,317**

**Int. Cl. F21v 33/00**

**U.S. Cl. 240—2 SL** **3 Claims**

An improved lamp assembly is provided which may be used, for example, as an advertising display, or for illuminating purposes wherever a soft light is desired, such as in bars, as a night lamp in a child's room, or the like. The lamp comprises a translucent plastic casing having a conical shape, and an electric lamp and socket positioned within the casing. The lamp socket is removably mounted on a spider which is fastened to

the bottom of the casing by appropriate screws, or other fasteners. Decals containing advertising messages, slogans, or the like, may be affixed to the exterior surface of the casing to



be illuminated when the lamp is energized. In addition, one or more plastic annular members of varying diameters may be fitted over the casing to form shelves for small toys, such as cars, dolls, or the like.

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3,819,925

## CHEMILUMINESCENT DEVICE

**Herbert P. Richter, China Lake, and Ruth E. Tedrick, Ridgecrest, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed Mar. 12, 1973, Ser. No. 340,434**
**Int. Cl. F21v 9/16**
**U.S. Cl. 240—2.25** **6 Claims**

Radiation cross-linked polyolefines are used to fabricate containment devices for chemiluminescent systems which utilize oxalate ester-fluorescer solutions as one component.

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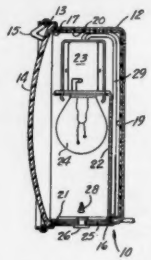
3,819,926

## WATERPROOF SIGNAL LIGHT FOR BOAT TRAILERS

**Kenneth L. Hess, 6763 Ferrier Ct., Sacramento, Calif. 95822**

**Filed May 30, 1973, Ser. No. 365,140**
**Int. Cl. B60q 1/00, 3/00**
**U.S. Cl. 240—7.1 R** **2 Claims**

A waterproof signal light for boat trailers including a metal housing having a transparent lense covering one side thereof. The housing has therein a transparent internal housing having an opening at the bottom thereof only. A bracket insertable through an opening in the bottom of the metal housing and the opening in the bottom of the transparent housing carries the signal bulb thereon. The bracket is secured to the metal housing so as to underlie the opening therein. When the boat trailer is backed into the water sufficiently to emerse the signal light in the water the air tight transparent inner housing will permit the water to raise until the pressure of air therein balances the pressure of the water at a point below the electric bulb and



socket so that the electric bulb and socket does not become wetted when the signal light is emersed.

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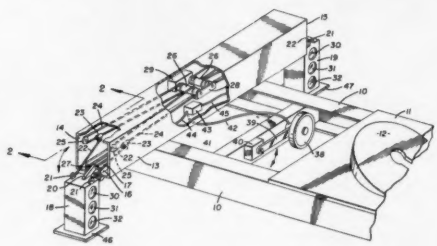
3,819,927

## RETRACTABLE DIRECTIONAL LIGHTS FOR TRUCK TRAILER VEHICLES

**Howard D. Pollock, 478 Flagler Ln., Poland, Ohio 44511**

**Filed Dec. 18, 1972, Ser. No. 316,393**
**Int. Cl. B60g 1/32, 1/48**
**U.S. Cl. 240—8.22** **7 Claims**



A mounting structure positioned on a truck-tractor adjacent the cab is provided with outwardly and downwardly movable spotlight assemblies selectively directed rearwardly along the sides of the trailer. Apparatus is provided in the mounting structure for imparting movement to the spotlight assemblies and a remotely controlled switch is provided for selectively illuminating the spotlights.

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3,819,928

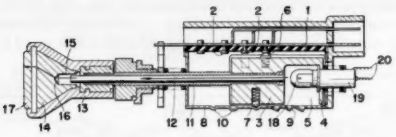
## SWITCH KNOB LIGHTING DEVICE

**Toshinobu Kuroyama; Motoi Noba, both of Toyota; Takahiko Fukuyama, Mino, and Nobuyuki Teranishi, Nagoya, all of Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Nishikasugai-gun and Toyota-City, Aichi-Pref., Toyota-City, Aichi-Pref., both of, Japan**

**Filed Oct. 5, 1972, Ser. No. 295,119**
**Claims priority, application Japan, Oct. 6, 1971, 46-91762**
**Int. Cl. F21v 33/00**
**U.S. Cl. 240—2 S** **2 Claims**

A switch knob lighting device for lighting a switch knob arranged on a dashboard of an automobile from the interior of the knob in combination with a switch structure. Said knob lighting device comprises an operating rod for operating the switch, a transparent rod of an optical fibre material fitted in a cylindrical hollow formed in said operating rod through the entire length thereof and a knob fitted over the top of the operating rod. The device further comprises a light source disposed at the inner end of the operating rod, a conic lens fitted in a hollow formed in the knob and a transparent indica-

tion plate fitted to the outer face of the knob. Thus, the light issued from the light source is introduced straight through the



transparent rod and diffused by the conic lens thereby to illuminate the indication plate from the interior of the knob.

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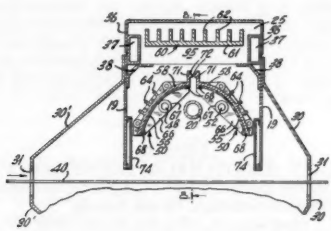
**3,819,929**
**ULTRAVIOLET LAMP HOUSING**

**Henry C. Newman, Scotch Plains, N.J., assignor to Canrad Precision Industries, Inc., Newark, N.J.**

**Filed June 8, 1973, Ser. No. 368,438**
**Int. Cl. F21v** *7/00*
**U.S. Cl. 240—41.37** **15 Claims**



An ultraviolet lamp housing has side and end walls defining a relatively elongated lamp enclosure having an elongated opening at one side, in the operative position of the housing. An elongated ultraviolet lamp is mounted between the end walls. A pair of elliptical reflector sections are mounted in the enclosure for rotation about axes extending in spaced parallel relation to the lamp. The reflector sections have a first closed position in which they form an elliptical reflector having a first focus at the lamp and a second focus at the plane of the opening, and have a second closed position in which they are interposed between the lamp and the opening. The side of the lamp enclosure opposite to the opening is formed with a coolant duct and a heat sink is mounted in this duct and displaceable coordinate with the reflector sections. In the first closed position of the reflector sections, the heat sink is disposed in spaced relation to the closed reflector sections and toward the outer side of the coolant duct. In the second closed position of the reflector sections, the heat sink is moved inwardly to form an inner wall of the coolant duct. In another embodiment of the invention, the heat sink may be stationary and form the inner wall of the duct and, in this case, conduits for the flow of liquid coolant are superposed on the heat sink for extracting the heat of the lamp enclosure.

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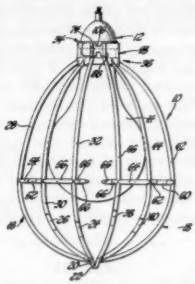
**3,819,930**
**LAMP GUARD**

**Romanus Michael Lamont, 4650 Shifman Rd., Goodrich, Mich. 48438**

**Filed Mar. 27, 1973, Ser. No. 345,284**
**Int. Cl. F21v** *15/02*
**U.S. Cl. 240—54 R** **6 Claims**

An integrally formed plastic guard for a lamp or bulb to be contained therein has a plurality of generally longitudinally extending curvilinear guard struts which are, at one end, joined to a generally medially situated hinge and, at another end, joined to a mounting bracket or collar assembly by which



the entire plastic guard can be secured as to associated socket means carrying the lamp or bulb.

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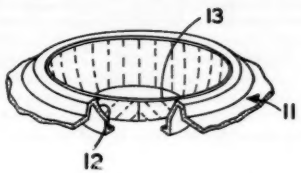
**3,819,931**
**VEHICLE LAMPS**

**Stanley Green, Warley, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England**

**Filed Dec. 30, 1971, Ser. No. 214,250**
**Claims priority, application Great Britain, Jan. 13, 1971, 1589/71**
**Int. Cl. F21v** *7/10*
**U.S. Cl. 240—103 R** **6 Claims**



A vehicle lamp comprising a body having a non-developable recess therein to receive a bulb, and a reflector lining the recess. The reflector is formed from a sheet of reflective material which has slits therein to enable it to be deformed to conform to the shape of the recess.

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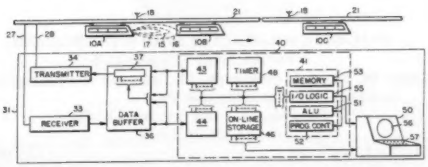
**3,819,932**
**MULTI-COMPUTER AUTOMATIC VEHICLE CONTROL SYSTEM**

**John H. Auer, Jr., Fairport; Donald B. Marsh, Rochester, and John J. DiPaola, Penfield, all of N.Y., assignors to General Signal Corporation, Rochester, N.Y.**

**Filed Mar. 22, 1972, Ser. No. 237,197**
**Int. Cl. B61l** *21/10*
**U.S. Cl. 246—1 R** **21 Claims**




A multi-computer automatic vehicle control system for controlling vehicles travelling along path rails in a route plan from

a central control station. A data communication link transmits vehicle performance reports from each of the vehicles to the central control station and transmits vehicle command messages from the central control station to the vehicles. On each of the vehicles is an on-line control system for decoding vehicle command messages and assembling performance report messages and a speed control unit for controlling acceleration and braking of the vehicles. An on-line control system in the vehicle includes logic circuitry for receiving and decoding the vehicle command message, recognition circuitry to detect the addressed vehicle and control circuitry for synchronizing the transfer of data within the on-line control system in each vehicle. A computer set in the central control station provides speed control commands and identity words which are included in the command message to the vehicles.

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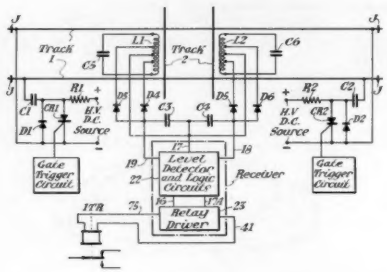
### 3,819,933
### DETECTOR TRACK CIRCUIT FOR RAILROAD CROSSINGS

**Reed H. Grundy, Murrysville, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.**

**Filed Dec. 8, 1972, Ser. No. 313,608**
**Int. Cl. B61l 23/30**
**U.S. Cl. 246—114** **9 Claims**




A separate transmitter source of periodic high voltage pulses is coupled to each approach section rails at the end distant from the permanent shunt across the rails at a railroad crossing. Each pulse transmits a high level oscillating current pulse through the rail loop including the intersecting rail shunt so that similar track currents flow in both approach sections. A single receiver means is coupled to each rail shunt by a separate pickup coil, the output of which is rectified to charge a storage capacitor at an averaged voltage level representative of the amplitude of the current pulses in the corresponding shunt. The voltages stored in both capacitors are applied to the dual inputs of a two channel, vital level detector and logic AND circuit element. An output signal is produced by the level detector and AND circuits only when both inputs are at or above a level representative of an unoccupied section. The output is then applied, through a relay driver circuit, to a vital type track relay to jointly register the occupancy condition of both crossing approaches.

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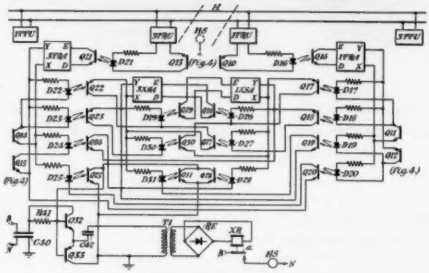
### 3,819,934
### FAIL-SAFE SOLID STATE HIGHWAY CROSSING PROTECTION APPARATUS

**John W. Kramer, Pittsburgh, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.**

**Filed Mar. 2, 1973, Ser. No. 337,596**
**Int. Cl. B61l 1/02**
**U.S. Cl. 246—130** **13 Claims**

Solid state static relays, with contact circuits including insulated signal couplers formed by light emitting diodes and light responsive transistors, are used as track circuit detectors and directional stick devices in highway crossing protection systems. Each relay control circuit requires modulated switching across control input terminals to condition that relay to an energized state which activates front contact couplers. Absence of the modulated switching or a continuous circuit across the terminals conditions the relay coil circuit to activate only back contact couplers. A solid state directional logic network for highway crossing protection is formed by a



selected circuit arrangement of insulated coupler elements which fulfills in a fail-safe manner the Boolean functions representing the directional crossing protection logic. The crossing protection device is controlled through an output buffer circuit by other selected couplers representing the control functions by which the device is activated only for approaching trains.

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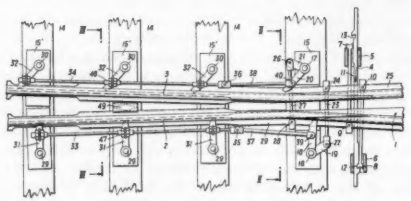
### 3,819,935
### RAILWAY SWITCH FOR VIGNOLES RAILS

**Hannes Lindner, Leoben, Austria, assignor to Oesterreichisch-Alpine Montangesellschaft, Vienna, Austria**

**Filed Sept. 21, 1972, Ser. No. 291,076**
**Claims priority, application Austria, Sept. 21, 1971, 8186/71**
**Int. Cl. E01b 7/10**
**U.S. Cl. 246—435** **16 Claims**



An improvement for a railway switch for vignoles rails of the type comprising a frog tip and wing rails arranged for swinging movement, one of the wing rails engaging the frop tip in the respective end positions and being maintained in engagement with the frog tip by movable supporting members supporting the wing rail in direction to the rail axis and being connected with the railway sleepers and preferably acting on the rail web, the improvement being that the supporting members are supported independently on the actuating means for the wing rails and rested on sliding plates connected to the sleepers.

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### ERRATUM

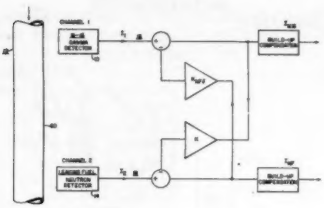
For Class 250—2 see:
Patent No. 3,819,542

3,819,936

## POWER MEASURING AND FUEL LEAKAGE DETECTION SYSTEM

Harald H. Weiss, Vienna, Austria, and Rau Gopal, Monroeville, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 12, 1971, Ser. No. 171,107
Int. Cl. G01t 1/16, 3/00
U.S. Cl. 250—83.3 R 8 Claims



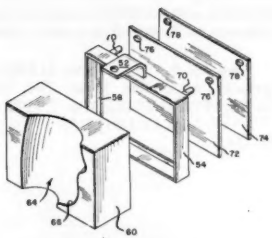
An $N^{16}$ reactor power measuring system is disclosed for measuring the thermal power of a nuclear reactor in the presence of fission product activity in the primary coolant. Furthermore, the system provides a fast response signal for the indication of any leaking fuel within the reactor core.

3,819,937

## APPARATUS AND METHOD FOR MAKING X-RAY FILMS

Arvi A. I. Sovijarvi, Mantytie 17 B 24, 00270 Helsinki 27, and Niilo N. Jaronen, Niitykumpu 3 E 81, 02200 Niitykumpu, both of Finland

Continuation of Ser. No. 123,366, March 11, 1971, abandoned, which is a continuation of Ser. No. 717,162, March 29, 1968, abandoned. This application Nov. 30, 1971, Ser. No. 203,425
Int. Cl. H05g 3/00
U.S. Cl. 250—505 5 Claims



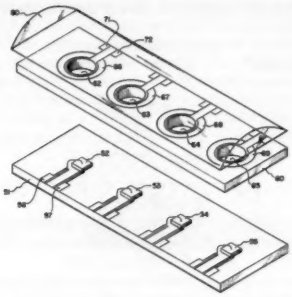
The quality of X-ray images of the softer tissues of the human body is enhanced by disposing between the subject and the X-ray image converter a bone-image compensating filter having an X-ray resistance which varies in a continuous manner over two-dimensions. Specifically, the X-ray resistance of the filter varies from point-to-point in such a manner as to substantially, but not completely, equalize the total resistance to X-rays passing through adjacent portions of the subject. The filter thereby substantially suppresses the image of the skeletal structure in the resulting X-ray image and, without significant distortion, correspondingly enhances the images of the softer tissues.

3,819,938

## OPTO-ELECTRONIC TRANSDUCERS FOR OBJECT DETECTION

William P. Kornrumpf, and John D. Harnden, Jr., both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Feb. 1, 1973, Ser. No. 328,530
Int. Cl. G01p 3/68
U.S. Cl. 250—222 R 15 Claims



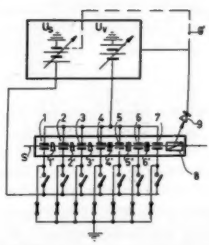
A coaxial opto-electronic transducer adapted for fabrication by integrated circuit techniques is disclosed. A semiconductor light source is disposed on a base member. A support member having a void therein is disposed about the semiconductor light source on the base member. A polycrystalline photoresponsive device is located on the support member proximately the void therein. Light emitted by the light source is reflected from an object in the path of propagation of the light and a portion of the reflected light is directed onto the photoresponsive device. Since the polycrystalline photoresponsive device is on the order of 1 mil in thickness, and is spaced from the periphery of the void in the support member, the support member serves to prevent direct illumination of the photoresponsive device by light emitted by the semiconductor light source.

3,819,939

## DIGITAL LIGHT DEFLECTOR

Manfred Rahlff, Hamburg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 13, 1972, Ser. No. 288,594
Claims priority, application Germany, Sept. 15, 1971, 2146123
Int. Cl. G01n 7/00
U.S. Cl. 250—225 6 Claims



A digital light deflector is described which comprises a plurality of deflector stages which each include a polarization switch and a birefringent element. It is shown that the stray light can be determined by introducing, behind the last deflector stage, an additional polarization switch and a polarization

separating element and also a radiation-sensitive detector which converts the stray light into an electric signal for controlling the switching voltage of the polarization switches.

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**3,819,940**

## OPTICAL INSTRUMENTS

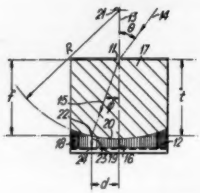
**Arthur Ernest Laws, St. Albans, England, assignor to Hawker Siddeley Dynamics Limited, Hatfield, Hertfordshire, England**

**Filed June 7, 1973, Ser. No. 367,721**

**Claims priority, application Great Britain, June 8, 1972, 13328/72**

**Int. Cl. G02b** *5/14*

**U.S. Cl. 250—227** **9 Claims**



An optical instrument wherein an optical signal is projected on to a sensor array or sensitive medium and angular deflections of the path of the optical signal about an instrument signal source as centre appear as displacements from a datum lying in the general plane of the sensor array or sensitive medium, the instrument having an optical axis passing through said source and normal to said plane, characterized in that, to correct for the tangent law error that would otherwise arise, a correcting optical device is interposed in the signal path and has its surface receiving the signal curved, in the concave sense, about a centre lying on or intersecting the optical axis of the instrument, the curvature being of radius R, where R is greater than the distance *t* from said instrument signal source to the point in said curved surface that lies on said optical axis, the surface of the correcting optical device facing the sensor array being plane.

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**3,819,941**

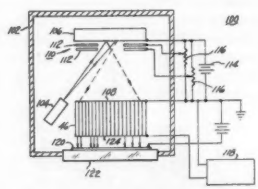
## MASS DEPENDENT ION MICROSCOPE HAVING AN ARRAY OF SMALL MASS FILTERS

**John P. Carrico, Royal Oak, Mich., assignor to The Bendix Corporation, Southfield, Mich.**

**Filed Oct. 15, 1973, Ser. No. 406,436**

**Int. Cl. H01j** *37/26*

**U.S. Cl. 250—281** **28 Claims**



A mass dependent ion microscope having an array of very small mass filters, interposed between the source of an ion image and an image transducer for transmitting on a point-for-point basis only ions of a predetermined mass-to-charge ratio, is described. The point-for-point transmission by the mass filter array preserves the image information of the original ion image and permits the filtered ion image to be visually observed on a phosphor screen or otherwise detected. The individual filter elements of the array may be either of the monopole or quadrupole structure fabricated from glass.

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**3,819,942**

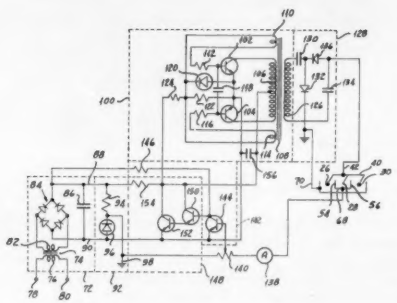
## REGULATED POWER SUPPLY FOR CORONA CHARGING UNIT

**Peter J. Hastwell, North Adelaide, and E. Barton Gliddon, Plympton North, South Australia, both of Australia, assignors to Savin Business Machines Corporation, Valhalla, N.Y.**

**Filed May 7, 1973, Ser. No. 357,664**

**Int. Cl. G03g** *15/00*

**U.S. Cl. 250—324** **5 Claims**



A regulated power supply for the corona charging unit of an electrostatic copying machine in which the difference between a reference voltage derived from the supply mains and a voltage derived from a sample of the ionic current of the corona unit provides the input for a regulator which controls the amount of power supplied by a full wave rectifier connected to the supply mains to a D.C. converter which feeds a voltage doubler connected to the corona unit.

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**3,819,943**

## METHOD AND APPARATUS FOR DETECTING DEFECTS IN A SEALED PORTION OF A PACKAGE

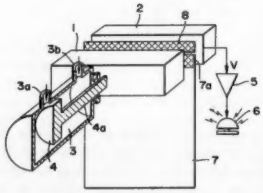
**Kazuhisa Ishibashi, and Yoshimi Terashima, both of Tokyo, Japan, assignors to Toyo Seikan Kaisha, Limited, Tokyo, Japan**

**Filed Dec. 5, 1972, Ser. No. 312,409**

**Claims priority, application Japan, Dec. 17, 1971, 46-102362; Feb. 25, 1972, 47-19492; Mar. 7, 1972, 47-23330**

**Int. Cl. G01j** *5/12*

**U.S. Cl. 250—341** **6 Claims**



Methods and apparatus for detecting defects in a sealed portion of a package, in which at least one sealed portion is interposed between a thermal member having a predetermined temperature distribution on its surface faced to said selaed portion and a temperature measuring device having some groups of temperature sensors on its surface faced to the op-

posite surface of the sealed portion, and the outputs of groups of temperature sensors are compared each other. Any difference between them means that the sealed portion is defective.

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3,819,944

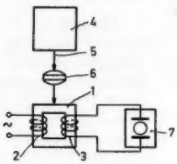
## PHOTOSENSITIVE MAGNETIC DEVICE

**David Edward Lacklison, Crawley; Alexander David Annis, New Maldon, and Ronald Ferguson Pearson, Beigate, all of England, assignors to U.S. Philips Corporation, New York, N.Y.**

**Continuation of Ser. No. 127,283, March 23, 1971, abandoned. This application Sept. 11, 1972, Ser. No. 287,970**

**Int. Cl. G01n** *27/00*

**U.S. Cl. 250—353** **6 Claims**




In well-known photomagnetic materials such as YIG and Cd Cr Se the change of magnetic permeability on exposure to light can only be erased by raising the temperature of the material. When using ferric borate however, erasure can be effected magnetically at constant temperature. A range of substituted ferric borates is disclosed with a possible theory for the effect and an outline of its uses in information storage devices of various kinds.

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3,819,945

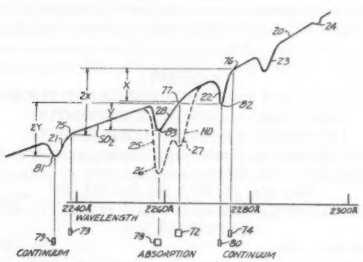
## SPECTROMETERS

**Dale W. Egan, Montrose; Geoffrey B. Holstrom, Los Angeles; Harry C. Lord, Pasadena; Robert W. Stevens, San Dimas; Darrell P. Port, La Crescenta, and Rollen D. Howard, La Canada, all of Calif., assignors to Environmental Data Corporation, Monrovia, Calif.**

**Continuation of Ser. No. 158,885, July 1, 1971, abandoned. This application June 25, 1973, Ser. No. 372,993**

**Int. Cl. G01j** *3/00, 3/36*

**U.S. Cl. 250—373** **21 Claims**




The present disclosure relates to spectrometry. A method is disclosed for detecting nitric oxide (NO) without first converting it to nitrogen dioxide ($NO_2$) by determining the intensity of a spectral signature in the range between 2,259 and 2,269 Angstroms. Apparatus is provided which, in one form, utilizes an output shutter arrangement having a plurality of reciprocating vanes operated at mutually exclusive frequencies for passing regions of absorption radiation and continuum radiation. Circuit means is provided for distinguishing the signals derived at the various frequencies to determine the relative amount of particular material in a sample. In another form of the invention, an output chopper is provided having at least three slit apertures, the center aperture being adapted to pass only radiation at an absorptive wavelength and the two outer apertures being adapted to pass radiation in the continuum. A vane is adapted to reciprocate between a first position wherein the chopper passes only radiation through the center aperture and a second position wherein the chopper passes only radiation through the two outer apertures. The area of each of the two outer apertures is preferably one-half the area of the center aperture. A detector viewing radiation passed by the chopper will average the radiation received from the two outer apertures. In yet another aspect of the invention, a window assembly is provided so that the spectrometer may be used as a a stack monitor, the window assembly having a slidable window which may be removed for cleaning purposes.

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3,819,946

## APPARATUS FOR MEASURING THE LOCAL NEUTRON DENSITY DISTRIBUTION IN THE INTERIOR OF A NUCLEAR REACTOR

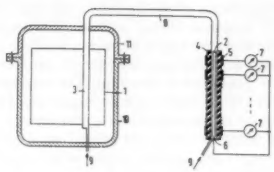
**Aribert Fracke, deceased, late of Erlangen, Germany (by Waltraut Fracke, Legal Representative), and Hans Wachtler, Baiersdorf, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany**

**Filed Aug. 3, 1972, Ser. No. 277,551**

**Claims priority, application Germany, Aug. 5, 1971, 2139152**

**Int. Cl. G01t** *3/00*

**U.S. Cl. 250—374** **8 Claims**



A system which measures the local neutron density distribution in the fission zone within a nuclear reactor. The measuring system includes a guide tube mounted in and extending through the reactor wall and the fission zone. A probe configured as a helical spring is mounted for motion within the interior of the guide tube and is driven by compressed air between activation and measurement positions located internally and externally of the reactor vessel, respectively. A measuring unit is connected with the guide tube for measuring the level of radioactivity of the probe when it is in its measurement position.

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3,819,947

## PHOTODYNAMIC MONITOR FOR AND PROCESS OF DETECTING THE MOMENTARY PRESENCE OF AN OBJECT BETWEEN TWO POINTS

**Winston O. Johnson, Smyrna, and David W. Davis, Stone Mountain, both of Ga., assignors to Ted Willis, Atlanta, Ga.; Willis H. Holley, Panama City, Fla.; Harold L. Lyles, Sumter, S.C.; Kennedy H. Sharp, Hiddenite, N.C. and William L. Stuart, Jacksonsville, Fla., a part interest to each**

**Filed Dec. 26, 1972, Ser. No. 318,621**

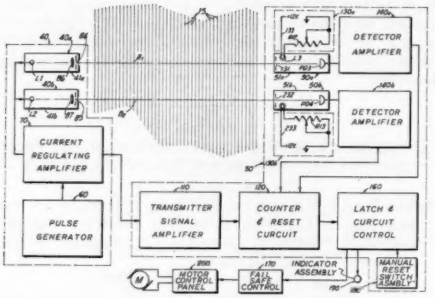
**Int. Cl. G01n** *21/30*

**U.S. Cl. 250—559** **39 Claims**

A photodynamic monitor or stop motion machine for detecting when a yarn has passed across a space and for automatically biasing a circuit to shut down a textile machine upon

such an occurence. The stop motion machine has one or a plurality of transmitters for transmitting infrared light in time-spaced pulses across a tufting machine (or other textile machine) adjacent selected yarns, and one or more transducers which digitally compare the original signal with the received signal for biasing the fail safe control circuit when a programmed discontinuity is detected. Reflecting surfaces direct the light pulses along prescribed paths between one or more of the transmitters and transducers.

The transmitter includes a pulse generator, generating pulses in the $2kH_z$ range, each having a duration of 25 microseconds, and a current regulating amplifier which feeds these pulses to one or a plurality of infrared emitting diodes.




The transducer includes one or more infrared sensing detectors, for receiving the infrared beams, each detector being also illuminated by an individually controlled lamp, the brighness of which is adjusted so as to extend the modulation transfer function characteristics of the detector, and thus, improve the high frequency response of the detector. The received signal of each sensing detector is sent through a detector amplifier to the reset circuit of a counter, into which counter the signal from the pulse generator is also sent. The counter and reset circuit includes a Nand Gate Schmitt trigger which detects any drop in amplitude of the signal and a comparator gate which transmits the pulse counter differential to a decoder programmed to trigger the fail safe circuit when a given number of successive pulses is received.

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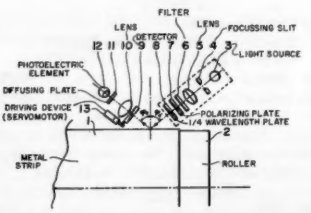
**3,819,948**

## METHOD AND APPARATUS FOR CONTROLLING THE QUANTITY OF OIL COATED ON CONTINUOUSLY MOVING MATERIAL

**Hiroshi Iijima, Yokohama; Kinya Inamoto, Kawasaki; Shuzo Fukuda, Yokohama; Takashi Shimoma, Yokohama, and Tsuneharu Miyachi, Yokohama, all of Japan, assignors to Nippon Kakan Kubushiki Kaisha, Tokyo, Japan**

**Filed Mar. 15, 1973, Ser. No. 341,580**
**Claims priority, application Japan, Apr. 21, 1972, 47-39557**
**Int. Cl. G01b** *11/00*
**U.S. Cl. 250—559** **15 Claims**




A pair of optical systems are provided along the path of travel of the material at positions before and after oiling. Each optical system comprises a polarized light projector and a receiver for receiving the polarized light reflected from the oil film coated on the material. By comparing the outputs of two receivers, the thickness of the oil film can be determined. To automatically control the quantity of the oil to be coated on the material, the difference between the outputs of the two receivers at different or the same azimuth angles of the optical axes of the two receivers is detected and this difference is used to control the operating condition of an electrostatic oiling device.

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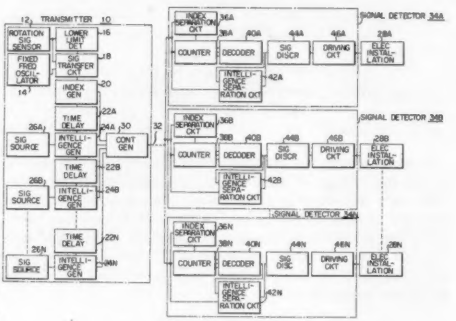
**3,819,949**

## CONTROL SYSTEM FOR ELECTRIC INSTALLATIONS

**Atsushi Ueda, and Mitsuaki Ishii, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Jan. 2, 1973, Ser. No. 320,684**
**Int. Cl. H02g** *3/00*
**U.S. Cl. 307—10 R** **9 Claims**




A control system for electric installations is disclosed. In response to one rotation signal for each revolution of an engine, control intelligences in the form of a time-divided multiplexed pulse train is transmitted through a single transmission line to a plurality of detector units, the pulse train having an index pulse resulting from the rotation signal. In each detector unit the counting of the trains's pulses is initiated by the index pulse to determine that pulse assigned to an electric installation connected to the detector unit. At that time, the corresponding control intelligence pulse is restored from the pulse train to control the electric installation. A fixed frequency oscillator provides the rotation signal at rotational speeds of the engine which are less than a predetermined speed.

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**3,819,950**

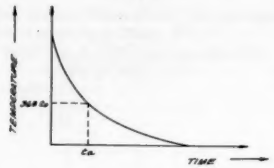
## REFERENCE VOLTAGE GENERATOR FOR THERMAL PROCESSES HAVING AN EXPONENTIAL TEMPERATURE-TIME CHARACTERISTIC

**Friedrich Korntheuer, Kapfenberg, Austria, assignor to Gebr. Boehler & Co., AG, Vienna, Austria**

**Filed May 18, 1973, Ser. No. 361,551**
**Claims priority, application Austria, May 18, 1972, 4331/72**
**Int. Cl. G05d** *23/00*
**U.S. Cl. 307—149** **3 Claims**

An improved arrangement is described for generating an exponential reference voltage for comparison in a suitable regulator with a value proportional to the measured temperature output of a thermal process having a desired exponential temperature-time characteristic. The generator includes an R-C circuit chargeable via a DC source wherein the time constant of the R-C circuit is chosen to equal the thermal time constant of the exponential thermal process. The voltage increase across the capacitor during charge or the voltage decrease across the capacitor during a subsequent discharge is employed selectively as a reference voltage for controlling,

respectively, a rising and a falling exponential temperature-time characteristic of the thermal process. A cathode follower




or other input buffer amplifier is coupled to the output of the capacitor to isolate the R-C circuit from the loading effect of the input of the regulator.

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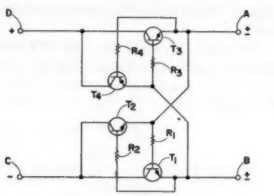
**3,819,951**

**POLARITY GUARD**

**Arthur D. Moore, Stittsville, Ontario, Canada, assignor to Microsystems International Limited, Montreal, Quebec, Canada**

**Filed Dec. 27, 1972, Ser. No. 318,760**
**Claims priority, application Canada, Nov. 28, 1972, 157645**
**Int. Cl. H03k** *17/00*
**U.S. Cl. 307—202** **7 Claims**




The invention relates to a polarity guard for insertion between terminals connected across a potential supply and a load means, the input polarity of which load means must be constant regardless of the polarities of the potential supply terminals. The invention has particular application to, but is by no means limited to the field of telephony wherein a transducer must often be capable of operation from a telephone line, the polarity of which is variable but the transducer requiring a constant polarity input. Typical of such a transducer is a headset amplifier for powering an electret or similar microphone in place of the traditional carbon microphone.

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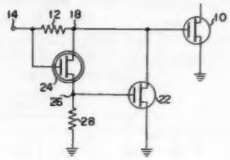
**3,819,952**

**SEMICONDUCTOR DEVICE**

**Tatsuya Enomoto, and Hiroshi Morita, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan**

**Filed Jan. 29, 1973, Ser. No. 327,463**
**Int. Cl. H02h** *7/20*
**U.S. Cl. 307—202** **5 Claims**

A first protecting insulated gate field effect (IGFE) transistor has a drain and a source connected respectively to a gate and a source of an IGFE transistor to be protected against overvoltages with the gate connected to an input through a resistor. A second protecting IGFE transistor higher in threshold voltage than the first protecting transistor has a source connected to the gate of the first protecting transistor and through another resistor to the source of the same transistor with its gate and drain operatively coupled to the input. The second protecting transistor first conducts in response to an overvoltage, applied to the input to decrease a voltage applied to the protected transistor and to conduct the first transistor. The




conduction of the first transistor causes a voltage much decreased from the overvoltage to be applied to the protected transistor.

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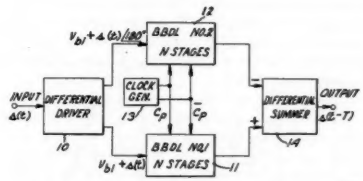
**3,819,953**

**DIFFERENTIAL BUCKET-BRIGADE CIRCUIT**

**Charles McD. Puckette, and Walter J. Butler, both of Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.**

**Filed Nov. 22, 1972, Ser. No. 308,717**
**Int. Cl. H03k** *21/00*; **G11c** *19/00*; **H03k** *17/26*
**U.S. Cl. 307—221 D** **16 Claims**




A pair of bucket-brigade delay lines have equal numbers of bucket-brigade stages, and corresponding stages are clocked in parallel and in-phase. The analog input signal to the circuit is applied to a differential driver for inverting the analog input signal to one of the delay lines relative to the other delay line. The outputs of the delay lines are differentially summed and result in an output waveform which is a sampled and delayed version of the analog input signal with cancellation of D.C. and clock frequency components that are normally introduced in bucket-brigade delay line circuits.

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**3,819,954**

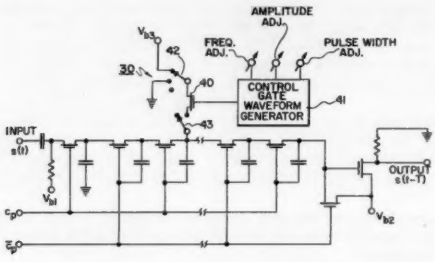
**SIGNAL LEVEL SHIFT COMPENSATION IN CHARGE-TRANSFER DELAY LINE CIRCUITS**

**Walter J. Butler; Mark B. Barron, both of Scotia, and Bruno Kurz, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.**

**Filed Feb. 1, 1973, Ser. No. 328,642**
**Int. Cl. H03k** *25/02*
**U.S. Cl. 307—221 D** **27 Claims**

Compensation for undesired shifts in the D.C. voltage level of a signal being propagated through a charge-transfer delay line is provided by compensating stages spaced at regular intervals along the delay line. The compensating stages are preferably transistors of the same type as that used in the delay line and having their source (or drain) electrodes connected to appropriate nodes along the delay line and their gate electrodes supplied from a pulsed source of voltage having controllable voltage amplitude and pulse repetition rate. The

drain (or source) electrodes are grounded for shifting the D.C. voltage level in a first polarity voltage direction and are open




or connected to a D.C. voltage source for shifting in the opposite polarity voltage direction.

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**3,819,955**

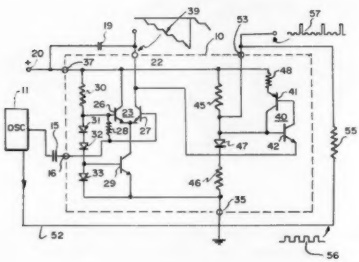
**COUNTER CIRCUIT USING CURRENT SOURCE**

**Francis H. Hilbert, 124 E. Moreland, Addison, Ill. 60101**

**Continuation-in-part of Ser. No. 165,958, July 26, 1971, abandoned. This application Oct. 20, 1972, Ser. No. 299,427**

**Int. Cl. H03k** *25/02*

**U.S. Cl. 307—225 R** **4 Claims**




An integrated counter circuit includes a charge storage capacitor having a charging path connected in series with an interrupted current source which is rendered alternately conductive and nonconductive by the input signal pulses or cycles which are to be counted by the circuit. The charge on the capacitor is applied to one input of a regenerative threshold switch which is supplied with a reference potential to establish the switching level. When the charge on the capacitor becomes sufficiently high enough the regenerative switch is rendered conductive and rapidly discharges the capacitor. To enhance the sharpness of the switching point of the regenerative switch, an attenuated input signal at the frequency used to switch the current source is applied to one of the inputs of the regenerative switch.

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**3,819,956**

**LOCKOUT MEANS FOR THYRISTOR FIRING CIRCUIT**

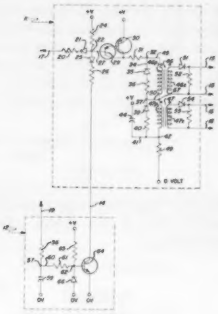
**Ronald W. Hughes, Stow; Mikel Jay Messick, Chagrin Falls, and John Rodgers Volpe, Bedford Heights, all of Ohio, assignors to Square D Company, Park Ridge, Ill.**

**Filed July 20, 1972, Ser. No. 273,562**

**Int. Cl. H03k** *17/00*

**U.S. Cl. 307—254** **5 Claims**

A thyristor firing circuit uses saturable transformers to transmit firing pulses to the thyristors. A lockout circuit causes a constant voltage to be applied to the transformer primaries to saturate the transformers so that neither circuit noise nor transients can produce firing pulses in the secondary windings.



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**3,819,957**

**TWO CHANNEL BALANCE CONTROL DEVICE**

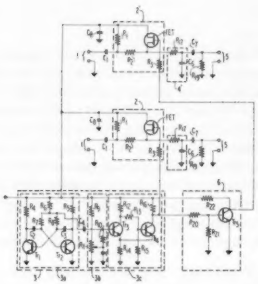
**Yoshifumi Saeki, Tokyo, and Saburo Takaoka, Kanagawa, both of Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan**

**Filed July 27, 1972, Ser. No. 275,669**

**Claims priority, application Japan, July 27, 1971, 46-56274**

**Int. Cl. H03k** *1/14*

**U.S. Cl. 307—264** **1 Claim**

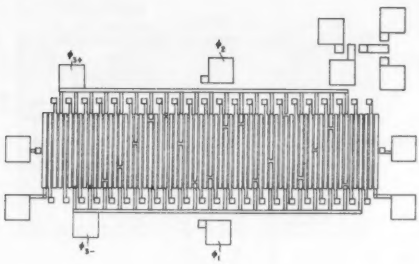


A signal level control device for varying the level of an input signal through the variation of a variable resistor. A switching circuit is turned ON for a period of time determined by the resistance of the variable resistor. The input signal is gated through the switching circuit during the ON time of the switching circuit. The output of the switching circuit is applied to a low pass filter which filters out the high frequency components due to the switching such that the output of the filter circuit is a signal having the same wave shape as the input signal and an amplitude proportional to the ON time of the switching circuit. By adjusting the variable resistor the ON time of the switching circuit is varied and thus the amplitude of the output signal is varied.

## 3,819,958
## CHARGE TRANSFER DEVICE ANALOG MATCHED FILTER

William Milton Gosney, Richardson, Tex., assignor to Texas Instruments, Incorporated, Dallas, Tex.

Filed Nov. 3, 1972, Ser. No. 303,440
Int. Cl. H011 *19/00*
U.S. Cl. 307—304 8 Claims

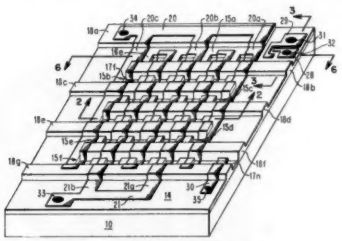


A bridge detector for measuring the charge stored in each delay stage of a charge transfer device analog matched filter, and weighting the tapped signals with a preselected value of unity or less is disclosed. The bridge detector includes two clock lines commonly connected at one end to one phase of a multiphase clock source, the other ends respectively connected to different portions of a split transfer electrode in each delay stage, the relative area ratio of the two portions defining the weighting for that stage. A differential amplifier measures the voltage across the two clock lines.

## 3,819,959
## TWO PHASE CHARGE-COUPLED SEMICONDUCTOR DEVICE

Joseph J. Chang, Shelburne, and John W. Sumilas, Williston, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 4, 1970, Ser. No. 95,225
Int. Cl. H011 *11/14*
U.S. Cl. 307—304 2 Claims

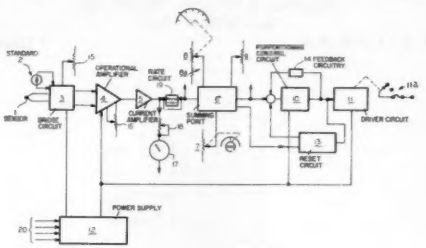


A semiconductor device which utilizes the mobility of charge in depletion regions created at the surface of a semiconductor body to transmit information and which comprises an electrode array deposited on the surface of a semiconductor body of a single type conductivity so that two out of phase electrical pulses can be applied to the electrodes comprising the array to create depletion regions of different levels in the body and thus transport a charge, injected into the semiconductor body, through the body and a sensor for measuring or detecting the transferred charges so that the described device can be used as a shift register or delay line. A plurality of the devices can be arranged to provide a simple, fast, reliable memory array.

## 3,819,960
## CONTROLLER CIRCUIT

Mitchell I. Kohn, Arlington Heights, and Ahdor Hermyrt Alton, Lake Zurich, both of Ill., assignors to Love Controls Corporation, Wheeling, Ill.

Continuation-in-part of Ser. No. 249,287, May 1, 1972, Pat. No. 3,777,187. This application Jan. 26, 1973, Ser. No. 326,949
Int. Cl. H01v *3/00*
U.S. Cl. 307—310 26 Claims

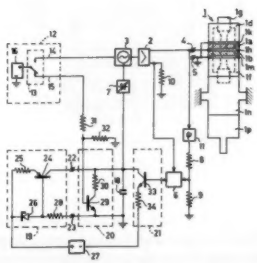



An improved controller that provides features, such as signal summing after amplification of the error signal, thereby minimizing adverse noise effects utilizing full scale amplification to enable analog display of the monitored parameter and conversion of a normal signal. The amplified error signal may be treated by a rate circuit to reduce lag problems. One of the amplifier stages includes feedback to provide proportioning output control through a solid state driver circuit that offers features, such as zero cross over detection, full cycle operation and excellent switching resolution. The novel circuitry provides a signal that is used in conjunction with the summed signal to provide automatic reset. The set point control accurately tracks the non-linear response characteristic of the sensing means such as thermocouples to provide a virtually errorless set point control signal to the summing circuit. A second set point control signal controls processes such as cooling, in addition to heating.

## 3,819,961
## ARRANGEMENT FOR GENERATING ULTRASONIC OSCILLATIONS

Ivan Marie Gaston Prudent Bourgeois; Henricus Petrus Cornelis Daniels, and Ronny Julius Camiel Cornelius Verlet, all of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 2, 1973, Ser. No. 319,982
Claims priority, application Netherlands, Jan. 3, 1972, 7200003
Int. Cl. H01v *17/00*
U.S. Cl. 310—8.1 8 Claims



A control circuit for a transducer comprising a tunable oscillator for driving the transducer at resonance, and a feed-

back loop responsive to the transducer comprising a phase detector which develops a series of pulse width modulated binary pulses, a D.C. source, an integrator, and various switching means to control the tunable oscillator.

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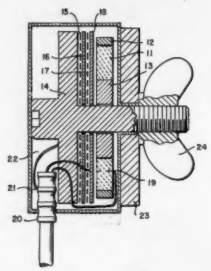
3,819,962

## BALLISTIC IMPACT DETECTOR

**Larry E. Ivey, and Theodore A. Henriquez, both of Orlando, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed May 4, 1973, Ser. No. 357,147**
**Int. Cl. H04r** *17/00*
**U.S. Cl. 310—8.3** **3 Claims**



A ferroelectric ceramic ring transducer assembly for reliably sensing projectile impacts upon a target surface. The transducer is mounted by a single hole in the target to allow unimpeded vibration at the resonance frequency. In addition, the ring is designed to have a resonance frequency which matches the compressional impact shockwave to guard against false readings.

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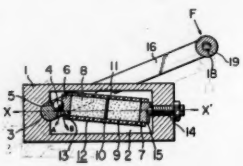
3,819,963

## HIGH VOLTAGE GENERATING PIEZOELECTRIC IGNITER

**Kaneichi Kondo, Settsu; Akira Ishii, Katano, and Hiromoto Takeuchi, Kishiwada, all of Japan, assignors to Matsushita Electric industrial Co. Ltd., Kadoma-shi, Osaka, Japan**

**Filed Jan. 29, 1973, Ser. No. 327,468**
**Claims priority, application Japan, Feb. 4, 1972, 47-15167; June 16, 1972, 47-71924**
**Int. Cl. H04r** *17/00*; **H03k** *3/00*
**U.S. Cl. 310—8.7** **6 Claims**



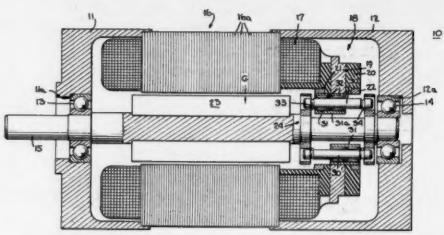
A static pressure type high voltage generating device of the kind in which a high voltage is generated by applying a static pressure to piezoielectric elements and which has simple structure, requires only a small operating force and moreover is excellent in durability.

3,819,964

## COMMUTATING STRUCTURE FOR D.C. PERMANENT MAGNET MACHINES

**Samuel Noodleman, Blacksburg, Va., assignor to Kollmorgen Corporation, Hartford, Conn.**

**Filed July 30, 1973, Ser. No. 383,883**
**Int. Cl. H02k** *13/00*
**U.S. Cl. 310—46** **14 Claims**



A DC permanent magnet machine in which the functions typically attributed to the stator and rotor assemblies are reversed to provide an "inside out" design. The stator is provided with a plurality of electrically energizable poles having windings which are electrically coupled to associated commutator bars forming an annular array. Also associated with the stator are a pair of annular conductive rings. The rotor is provided with a plurality of permanent magnet poles equal in number to the poles provided in the stator. The rotor also carries a plurality of roller contacts which serve to couple the commutator bars to the conductive rings which are in turn connected to opposite polarities of the DC energizing source, thereby providing electrical power to associated coils of the stator winding.

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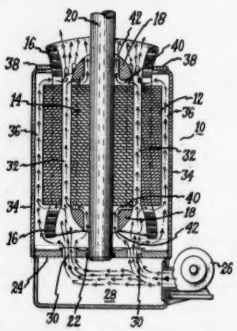
3,819,965

## COOLING SYSTEMS ESPECIALLY FOR DRY TYPE INDUCTION REGULATORS

**Charles W. Schoendube, Hickory, N.C., assignor to General Electric Company, Pittsfield, Mass.**

**Filed Nov. 20, 1972, Ser. No. 307,848**
**Int. Cl. H02k** *9/00*
**U.S. Cl. 310—58** **3 Claims**



An induction regulator is provided having cooling ducts on the exterior of the stator core. The ends of the rotor windings are spaced from the core and from the shaft to provide cooling ducts therebetween. An air deflector is provided at the upper end of the exterior cooling ducts to deflect cooling air through the stator winding and through the cooling ducts on the rotor

windings, thereby cooling the ends of such windings. The lower ends of both the stator and rotor winding are cooled by the direct blast of cooling air from the cooling air chamber.

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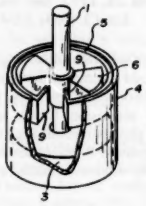
3,819,966

## MOTOR WITH INTEGRAL CONSTANT TORQUE CLUTCH

Masaru Noguchi, Tokyo, Japan, assignor to Alps Motorola, Inc., Tokyo, Japan

Filed Mar. 21, 1973, Ser. No. 343,221
Int. Cl. H02k 7/108
U.S. Cl. 310—74 9 Claims




A synchronous motor is provided with a constant torque clutch coupled between the output shaft of the motor and the rotor; so that when a high inertia load is coupled to the output shaft, the clutch slips to limit the torque supplied by the motor to the output shaft to a predetermined maximum value.

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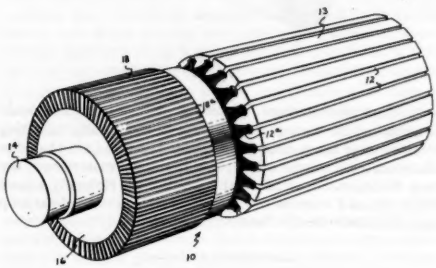
3,819,967

## ADHESIVELY BONDED COMMUTATOR

John Frank Binder, Burnt Hills, N.Y., assignor to General Electric Company, Lynn, Mass.

Continuation-in-part of Ser. No. 77,130, Oct. 1, 1970, abandoned. This application Mar. 1, 1972, Ser. No. 230,676
Int. Cl. H02k 13/04
U.S. Cl. 310—236 17 Claims



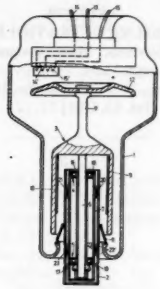

A commutator in which a base member having an outer cylindrical surface has metallic, electrically conductive commutating segments adhesively bonded to the cylindrical surface by a relatively thin layer of an adhesive material which is electrically non-conductive and has high dielectric strength. The base member is formed of a material characterized by extreme rigidity and thermal stability relative to the adhesive material, and the diameter of the base member is at least one hundred times greater than the thickness of the adhesive layer. The adhesive material is preferably selected from the group of adhesives consisting of epoxies and polyimides.

3,819,968

## ROTARY ANODE FOR X-RAY TUBES

Klaus Haberrecker, and Stefan Gunther, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Erlangen, Germany

Filed May 15, 1973, Ser. No. 360,408
Claims priority, application Germany, June 2, 1972, 2226714
Int. Cl. H01j 35/02
U.S. Cl. 313—60 5 Claims



A rotary anode for X-ray tubes, wherein the rotary system consisting of the plate, rotor and bearings is connected by springs with the casing of the tube. The invention is particularly characterized in that the plate and the rotor are mounted upon an axle to which a rotary ring of each of two bearings is connected, while the other rotary ring engages a tube provided with springs which provide a connection with the casing and have their own frequency which is substantially less than the driving frequency.

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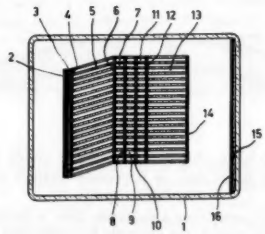
3,819,969

## DISPLAY DEVICE WITH A CHANNEL PLATE AND A CROSS BAR ELECTRODE ADDRESSING SYSTEM

Johannes Hendricus Maria Johanns; Johannes Hendricus Van Roosmalen, and Thijs Johannes De Boer, all of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 881,692, Dec. 3, 1969, abandoned. This application Mar. 1, 1972, Ser. No. 230,982
Claims priority, application Netherlands, Dec. 14, 1968, 6818016
Int. Cl. H01j 43/22
U.S. Cl. 313—105 8 Claims




A display device including an electron tube for image reproduction comprising an electron source having a substantially flat emissive surface and comprising a display screen discrete points of which are caused to luminesce by electrons impacting upon a luminescent substance. The selection of the points to be caused to luminesce is performed with the aid of

two grids arranged between the electron source and the display screen, each of which have non-intersecting electrodes, a so-called cross-bar. The surface of at least one grid facing the electron source is provided with an insulating or poorly conductive plate having closely adjacent, substantially parallel, narrow passages. The passages have conductive surfaces. The surface of the plate in which the passages are opening out and on which no grid is provided is covered with an electrically conductive layer. The passages are, in particular, secondary-emissive.

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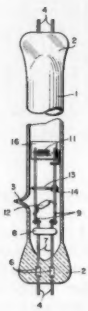
**3,819,970**

**LOW PRESSURE ULTRAVIOLET LAMP**

**William J. Roche, Merrimac, Mass., assignor to GTE Sylvania Incorporated, Danvers, Mass.**

**Filed Dec. 27, 1972, Ser. No. 318,827**
**Int. Cl. H01j** *61/12*
**U.S. Cl. 313—225** **3 Claims**



A low pressure ultraviolet lamp with an energy output effective in polymeric resin curing comprises a fused quartz envelope and a fill of mercury, argon and neon.

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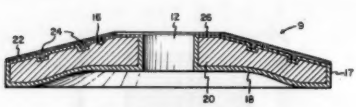
**3,819,971**

**IMPROVED COMPOSITE ANODE FOR ROTATING-ANODE X-RAY TUBES THEREOF**

**Richard B. Kaplan, Los Angeles; Sebastian Gonnella, Pacoima, and Walter M. Abrams, Van Nuys, all of Calif., assignors to Ultramet, Pacoima, Calif.**

**Division of Ser. No. 236,898, March 22, 1972. This application Dec. 12, 1972, Ser. No. 314,418**
**Int. Cl. H01j** *35/10*
**U.S. Cl. 313—330** **11 Claims**



Disclosed is an improved composite anode for rotating-anode x-ray tubes and an improved method of fabrication thereof.

The anode comprises a substrate disk, a portion of whose focal track is scored, for example by scratching or engraving of one or more annular grooves of rectangular cross-section. A coating of x-ray emissive material covers the scored region. In certain embodiments of the invention, the emissive coating is undercoated with an interlayer of a material which is a poor emitter of x-rays. The emissive coating and/or the undercoating may cover other portions of the disk and, in particular, may cover all exposed surfaces thereof.

The method comprises providing such a disk, scoring it in the focal track region and applying an x-ray emissive coating to the scored region. The last step may be preceded by the application of an undercoating of a material which is a poor x-ray emitter. Either or both coatings may be applied to other surfaces of the disk.

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**3,819,972**

**NOVEL GLASS COMPOSITIONS AND CATHODE-RAY TUBES MADE THEREFROM**

**Richard Dean Sanner, Sylvania, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio**

**Filed Feb. 28, 1972, Ser. No. 230,107**
**Int. Cl. C03c** *3/04*
**U.S. Cl. 313—480** **9 Claims**

Novel glass compositions containing strontium oxide are disclosed of enhanced chemical durability and working properties and x-ray absorbing capability. Cathode-ray tubes, in general, and color television tubes, in particular, may be formed from these glasses containing strontium oxide. These articles possess improved x-ray absorbing properties and increased resistance to adverse discoloration and browning of the glass.

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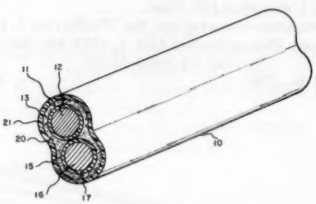
**3,819,973**

**ELECTROLUMINESCENT FILAMENT**

**Alonzo L. Hosford, 130 S. Brentwood Dr., Moorestown, N.J. 08057**

**Filed Nov. 2, 1972, Ser. No. 303,101**
**Int. Cl. H05b** *33/26*
**U.S. Cl. 313—498** **12 Claims**



An electroluminescent filament of at least two wires made of electrical conductors each having an electrically insulating covering over the surface is provided. The wires are placed in abutment and covered with a phosphorescent material and the total thickness of the filament is controlled. Helically wound wires are used wherein the distance between the helical loop centers is controlled for best performance.

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**3,819,974**

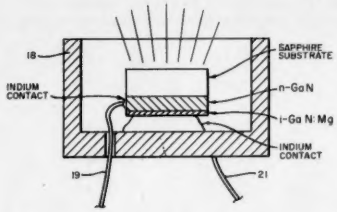
**GALLIUM NITRIDE METAL-SEMICONDUCTOR JUNCTION LIGHT EMITTING DIODE**

**David A. Stevenson, 331 Lincoln Ave., Palo Alto, Calif. 94301; Walden C. Rhines, 9321 Forest Ln., Apt. 1096, Dallas, Tex. 85231, and Herbert P. Maruska, 2326 California St., No. 39, Mountain View, Calif. 94040**

**Filed Mar. 12, 1973, Ser. No. 340,539**
**Int. Cl. H05b** *33/14*
**U.S. Cl. 313—499** **4 Claims**

A light emitting diode comprising a first layer of gallium nitride, a second, substantially intrinsic layer of magnesium

doped gallium nitride forming a junction therewith, a metallic rectifying contact to the second layer, an ohmic contact to the




first layer, and means for applying a voltage across said contacts and said junctions whereby to bias the device and generate light.

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**3,819,975**

**MULTI-DIGIT GLOW INDICATOR TUBE**

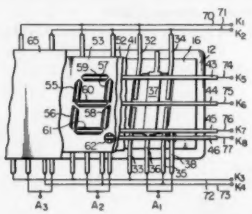
**Takao Kunii; Teruaki Tanaka; Sadaaki Kanaya, and Shuichi Nagayama, all of Osaka, Japan, assignors to Matsushita Electronics Corporation, Kadoma City, Osaka, Japan**

**Filed July 20, 1972, Ser. No. 273,492**

**Claims priority, application Japan, July 20, 1971, 46-54514; July 21, 1971, 46-54810**

**Int. Cl. H01j** *61/66*

**U.S. Cl. 313—517** **3 Claims**




The disclosure is of a matrix-type glow indicator tube capable of displaying a number of three figures. The indicator tube includes three groups of separate and distinct cathode elements, each group making up a figure eight. Three transverse cathode elements of each group are disposed on the top surface of an insulating plate having apertures extending therethrough, so that they extend transversely over their associated aperture. Each group also includes four longitudinal cathode elements which are disposed on the bottom surface of the insulating plate, so that they extend longitudinally under their associated aperture. An anode element is provided for each group of the cathode elements and lies in the same stratum as the longitudinal cathode elements. The anode element is positioned between the longitudinal cathode elements and extends parallel thereto. In this construction, the cathode elements of each group are energized in different combinations to provide representation of numerals zero to nine.

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**3,819,976**

**TA-AL ALLOY ATTENUATOR FOR TRAVELING WAVE TUBES AND METHOD OF MAKING SAME**

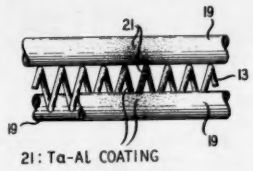
**John Michael Chilton, Coopersburg, and Donald Jaffe, Emmaus, both of Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkley Heights, N.J.**

**Filed May 11, 1973, Ser. No. 359,462**

**Int. Cl. H01j** *25/34*

**U.S. Cl. 315—3.5** **6 Claims**

The high frequency attenuator in a traveling wave tube and in other devices, in which the attenuator is disadvantageously subject to electron and/or ion bombardment, comprises an alloy coating of tantalum and aluminum. Also described is a process of fabricating such coatings in which the alloy is sputtered from a planar cathode comprising an aluminum plate and a perforated tantalum plate mounted on the aluminum plate.

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**3,819,977**

**VELOCITY MODULATION TUBE HAVING FLOATING RESONATOR CIRCUITS AND SHORT DRIFT SPACES**

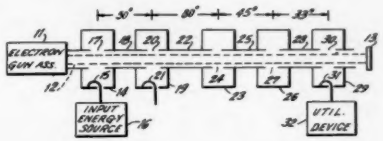
**Takao Kageyama, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan**

**Filed Mar. 26, 1973, Ser. No. 344,647**

**Claims priority, application Japan, Apr. 18, 1972, 47-38897**

**Int. Cl. H01j** *25/10*

**U.S. Cl. 315—5.43** **6 Claims**




In a velocity modulation tube comprising at least one floating prebuncher resonator and at least one final floating resonator, in which at least one of the floating prebuncher resonators has a fundamental mode of resonance at a frequency lower than the center frequency of the operating passband of frequencies of the tube, the normalized length of the drift space placed downstream of each low frequency floating prebuncher resonator is made longer than the normalized lengths of the drift spaces located downstream of the other resonators and not longer than 90° in terms of the reduced plasma angle.

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**3,819,978**

**CIRCUIT ARRANGEMENT FOR BRIDGING A POTENTIAL LEVEL, INCLUDING A CHOPPER**

**Gerhard Willem Broekema, and Rijk Hooghordel, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.**

**Filed Sept. 20, 1971, Ser. No. 182,070**

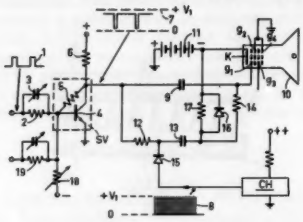
**Claims priority, application Netherlands, Sept. 15, 1970, 7013594**

**Int. Cl. H01j** *29/70*

**U.S. Cl. 315—26** **11 Claims**

The invention relates to a circuit arrangement for bridging a potential level. To this end the signals to be processed are superimposed on a chopper signal which has preferably needle-shaped pulses having steep leading and trailing edges. In order to maintain particularly the trailing edge steep, the signal amplifier – which supplies the output signal – is coupled to the chopper – which supplies the chopper signal – via a switching diode. It is ensured that the constant level of the amplitudes of the chopper signal is higher than the peak level of the output signal from the signal amplifier. A further advantage of this coupling method is that a plurality of signal amplifiers can be connected to the same chopper each via their own switching

diode. This creates the possibility of controlling both Wehnelt cylinder and focussing electrode from two signal amplifiers,



while the output signal from the first signal amplifier is also applied to the second signal amplifier. It is also possible to apply a plurality of input signals to one signal amplifier.

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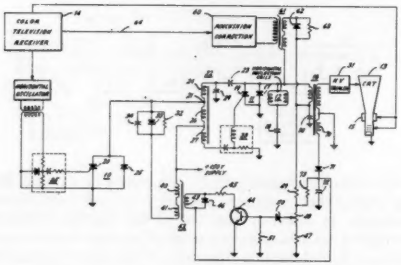
**3,819,979**

## HIGH VOLTAGE REGULATORS

**Walter Truskalo, Berwyn, Pa., assignor to Philco-Ford Corporation, Blue Bell, Pa.**

**Filed May 10, 1973, Ser. No. 358,991**
**Int. Cl. H01j** *29/70*
**U.S. Cl. 315—29** **6 Claims**



A television scan horizontal deflection circuit of the solid state switch variety also provides for the generation of high voltage to operate the display tube. A regulator circuit, connected into the deflection circuit, serves to regulate the high voltage in terms of low voltage power supply variations, such as would result from ordinary power line varitions. When pincushion correction signals are applied to such a circuit the high voltage value tends to vary as a function of the pincushion currents. This introduces raster distortions resulting from capacitive lag in the high voltage power supply. In an improved circuit, the regulator function is established so that it senses the magnitude of the high voltage power supply input pulses thereby maintaining the high voltage constant and avoiding the above-mentioned raster distortions. By incorporating a partial sensing of the deflection into the regulator, good response to changing power supply voltage is also achieved.

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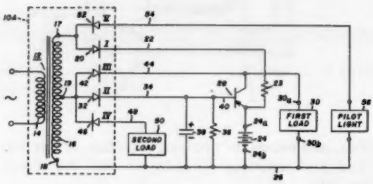
**3,819,980**

## EMERGENCY LIGHTING SYSTEM

**Ferdinand H. Mullersman, Gainesville, Fla., assignor to General Motors Company, Owensboro, Ky.**

**Filed Mar. 16, 1972, Ser. No. 235,371**
**Int. Cl. H05b** *41/14*
**U.S. Cl. 315—86** **9 Claims**

An emergency lighting system is provided for rapidly switching a battery into a load circuit in the event AC power on a main line is lost. A first rectifier normally supplied a first charging voltage from the AC power to the battery and a second rectifier supplies a second voltage to a monitoring circuit which keeps the battery switched out of the load circuit until the AC power is lost. In one embodiment where the load is a lamp or lamps the load is normally operating at below



rated AC voltage of the lamp for longer life. When the AC power fails, the battery provides sufficient power to the lamp or lamps to provide approximately the same light output. In another embodiment the load is intermittently supplied with battery voltage upon AC power failure to prolong the battery life and to attract attention to the power failure.

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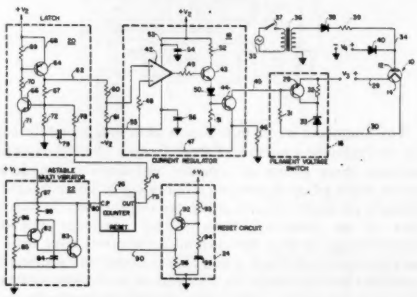
**3,819,981**

## AUTOMATIC START CIRCUIT FOR LAMP

**Allen M. Diamond, Orange, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.**

**Filed Mar. 2, 1973, Ser. No. 337,419**
**Int. Cl. H05b** *37/00*
**U.S. Cl. 315—86** **12 Claims**



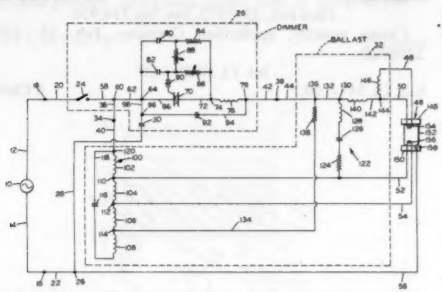
An automatic start circuit for a gas-filled tube having an anode and a cathode, such as a deuterium lamp, the anode thereof being connected to both a voltage source for providing a firing voltage and a current source for providing the operating current after firing. The filament of the tube has a first voltage thereacross upon application of power to the circuit. A time delay circuit is provided having a time delay consistent with the warm-up time required for the tube, the termination of the predetermined time delay actuating a current regulator for regulating the anode to cathode current flowing through the tube. After the tube fires, the flow of such current energizes a filament voltage switch to apply across the filament a second voltage lower than the first voltage to compensate for power dissipation in the filament by virtue of the current flow. The time delay means includes an astable multivibrator providing pulses to a counter, which, after a preset count initiates a pulse to actuate the current regulator. The counter is reset by a reset circuit immediately upon application of power.

3,819,982

## LOW NOISE DIMMER FOR FLUORESCENT LAMPS

Fred Eugene Nelson, Cranston, R.I., assignor to General Electric Company, New York, N.Y.

Filed Nov. 30, 1972, Ser. No. 310,680
Int. Cl. H05b 39/00
U.S. Cl. 315—94 3 Claims



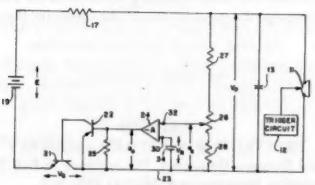

A phase control circuit for fluorescent lamps having low radio frequency noise signal generation characteristics which comprises a pair of control circuit terminals for connection into one power supply line of a pair for supply of conventional alternating current power.

3,819,983

## PHOTOFLASH POWER SUPPLY

Albion P. Bjork, Lincoln, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Sept. 8, 1970, Ser. No. 70,108
Int. Cl. H05b 37/00
U.S. Cl. 315—238 8 Claims




In a photoflash power supply a capacitor is charged to a predetermined voltage from an unregulated voltage source. The capacitor is then discharged to energize a photoflash lamp. A transistor switch is connected between the unregulated voltage source and the capacitor. When the voltage across the capacitor reaches the predetermined value, the transistor switch is completely cut off.

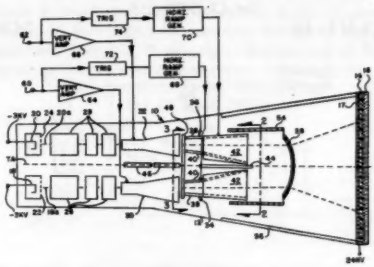
3,819,984

## SIDE-BY-SIDE DUAL GUN CRT HAVING HORIZONTAL DEFLECTOR PLATES PROVIDED WITH SIDE SHIELDS FOR CORRECTION OF GEOMETRIC DISTORTION

Kenneth William Hawken, Newberg, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Feb. 12, 1973, Ser. No. 331,457
Int. Cl. H01j 29/70
U.S. Cl. 315—27 GD 14 Claims

A cathode ray tube having dual electron beam guns and associated deflection means is described in which the electron beam guns are disposed in a plane containing the tube axis and such that the electron beam guns are located in planes spaced to the left and right of the tube axis which are normal to the first mentioned plane so that the electron beam guns are parallel to provide asymmetrical horizontal scanning thereby requiring less space in the tube neck. The horizontal deflection plate means is provided with side shields which provides dynamic geometry correction as the tube is operated.



## ERRATUM

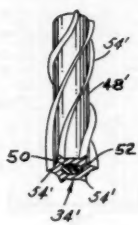
For Class 317—2 see:
Patent No. 3,818,545

3,819,985

## DISCHARGE ELECTRODES FOR ELECTROSTATIC PRECIPITATORS AND METHOD OF SHIPMENT AND INSTALLATION

Robert H. Dusevoir, 3014 Newburgh Rd., Wayne, Mich. 48184

Filed Dec. 1, 1972, Ser. No. 311,214
Int. Cl. B03c 3/41
U.S. Cl. 317—3 24 Claims




An electrostatic precipitator discharge electrode having an outer conductive sheath with a generally axially extending inner core therein and an insulator therebetween. To increase the electrode corona current emission the outer sheath has a plurality of conductive integral ribs terminating in apices extending generally radially outwardly of the sheath. The electrodes can be coiled and shipped to the job site where they are straightened and cut to the proper length for installation in a precipitator.

3,819,986

## EXCESS VOLTAGE PROTECTING CIRCUIT

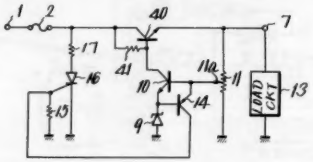
Toshimi Fukuoka, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 10, 1973, Ser. No. 349,728

Claims priority, application Japan, Apr. 14, 1972, 47-44030[U]

Int. Cl. G05f 1/58

U.S. Cl. 317—16 7 Claims




An excess voltage protecting circuit for use with an automatic voltage regulating circuit of the type which has a circuit breaker, fuse or the like connected in series between the automatic voltage regulating circuit and the power supply to be regulated, the excess voltage protecting circuit including means for detecting the output voltage from the voltage regulating circuit for producing a first control signal for the voltage regulating circuit and a second control signal, and a shunt circuit responsive to the second control signal which operates to trip the current breaking device when the voltage output from the voltage regulating circuit exceeds a predetermined level.

3,819,987

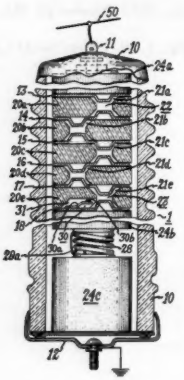
## SPARKOVER STABILIZING MEANS FOR AN UNGRADED SURGE VOLTAGE ARRESTER

Eugene C. Sakshaug, Lanesborough, Mass., assignor to General Electric Company, Pittsfield, Mass.

Filed Jan. 26, 1973, Ser. No. 326,790

Int. Cl. H02h 9/06

U.S. Cl. 317—70 11 Claims




An ungraded surge voltage arrester having a plurality of series connected sparkgaps is provided with sparkover stabilizing means that are effective to raise the minimum power frequency sparkover level of the arrester without significantly changing its maximum impulse sparkover voltage. The stabilizing means includes a tapered arrangement of different length sparkgaps in combination with a sparkgap preionizer mounted to ionize the sparkgap having the shortest gap length. Maximum length sparkgaps are disposed adjacent the high voltage terminal of the arrester.

3,819,988

## DEVICE FOR MOUNTING ELECTRICAL EQUIPMENT INCLUDING A SNAP FASTENING CONDUCTOR MOUNTING PLATE

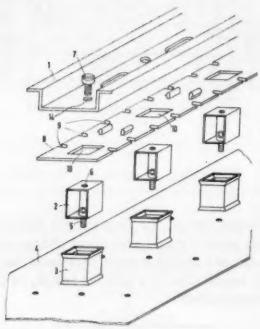
Fritz Pollmann, and Edgar Wiessner, both of Amberg, Germany, assignors to Siemens Aktiengesellschaft, Munchen, Germany

Filed Feb. 22, 1973, Ser. No. 334,930

Claims priority, application Germany, Feb. 25, 1972, 2208929

Int. Cl. H02b 1/20

U.S. Cl. 317—99 6 Claims



A device for mounting electrical equipment wired with electrical conductors is disclosed. The device has a base plate to which is fastened a support unit. Comb-like plates are disposed at the bottom side of the support unit and each has a plurality of notches for accommodating the electrical conductors therein. The support unit has a plurality of openings formed therein and snap-fastening extensions on each comb-like plate engage the support unit at the openings thereof.

3,819,989

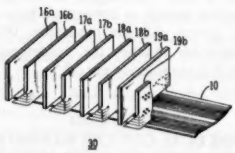
## PRINTED WIRING BOARD ASSEMBLY

David Paul Braune, Westmont, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 16, 1973, Ser. No. 379,790

Int. Cl. H05k 1/04

U.S. Cl. 317—101 F 9 Claims

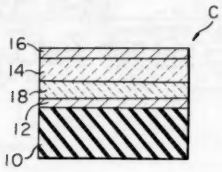



A printed wiring multiple circuit board assembly fabricated from a single blank, flexible tape carrying a plurality of conductors extending to circuitry carried by the circuit boards. The boards are arranged at right angles to a main tape at the end of tape tabs carrying branching conductors to a board circuitry. The tape tabs are folded and refolded so that the boards come to rest in mutually parallel planes perpendicular to the main tape.

## 3,819,990
## THIN-FILM CAPACITOR AND METHOD FOR THE FABRICATION THEREOF

Takeshi Hayashi, and Masami Onuki, both of Kawasaki, Japan, assignors to Matsushita Electric Industrial Company, Limited, Kadoma City, Osaka, Japan

Filed Dec. 29, 1972, Ser. No. 319,189
Claims priority, application Japan, Dec. 29, 1971, 47-262
Int. Cl. H01g 3/075
U.S. Cl. 317—258 8 Claims

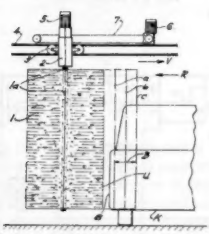



A thin-film capacitor comprising a substrate plate, a dielectric layer, a first electrically conductive layer interposed between the substrate plate and one surface of the dielectric layer, and a second electrically conductive layer provided on the other surface of the dielectric layer. The dielectric layer is made of a mixture of a such as $Al_2O_3$, $Y_2O_5$, $TiO_2$, $SiO_2$, $Ta_2O_5$, $BaTiO_3$, HfO or NbO and a divalent metal oxide such as an oxide of Be, Mg, Ca, Sr, Ba or Ra. The dielectric layer is formed by depositing the mixture on a first aluminum electrode by an electron beam deposition method. In order to further improve the properties of the thin-film capacitor, the surface of the aluminum electrode may be oxidized and the dielectric may be annealed in an atmosphere of nitrogen. Furthermore, a protective layer which has the same composition as the dielectric may be deposited on the second electrode.

## 3,819,991
## CONTROL DEVICE FOR A POSITION SELECTIVE MOTOR-DRIVEN WORK BRUSH

Gebhard Weigele, Bussardweg 2, 8900 Augsburg, and Johann Sulzberger, Mozartstrabe 17, 8901 Steppach, Germany

Filed Aug. 29, 1972, Ser. No. 284,679
Int. Cl. B60s 3/06
U.S. Cl. 318—39 2 Claims

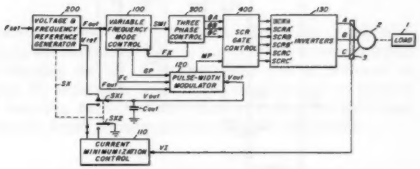


Control device for selecting the operating position of a work brush. In a brush which is movable to follow irregularities in the surface of a workpiece, such as the washing brush in an automotive wash station, means are provided for measuring the power demand by said brush and utilizing signals resulting therefrom to move the brush in a manner as to maintain the contact pressure substantially constant. In the preferred embodiment such means comprise a power meter measuring the power demand of the motor driving the brush and signals for correcting the position of the brush are emitted when said brush tends to fall below or move above predetermined limits.

## 3,819,992
## METHOD AND APPARATUS FOR PROVIDING EFFICIENT AND STABLE POWER INVERSION WITH VOLTAGE AND FREQUENCY CONTROL

Kenneth E. Opal, Oakmont; Charles R. Kelly, Murrysville; Charles W. Newcamp, Lower Burrell; William M. Ley, Oakmont, and Robert S. Pietkiewicz, Glenshaw, all of Pa., assignors to Power Control Corporation, Pittsburgh, Pa.

Filed Jan. 21, 1972, Ser. No. 219,704
Int. Cl. H02p 7/42
U.S. Cl. 318—171 6 Claims

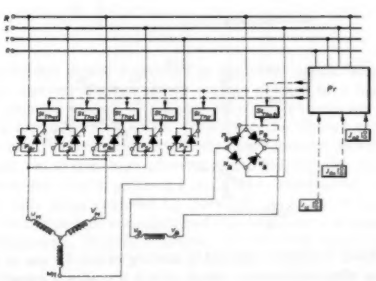



Three-phase pulse width modulated inverters are operated to drive an alternating current motor under varying frequency and voltage conditions. The modulated pulse rate is varied to maintain smooth motor control at low frequencies. Provision is made for automatic switching to a current minimization operation after start-up for constant load conditions and automatic switching is provided to change the modulated pulse mode when predetermined voltage limits of the inverters are exceeded.

## 3,819,993
## MOTOR CONTROL SYSTEM AND METHOD FOR FAST SPINDLE TYPE IMPACT PRESSES

Walter Dorr, Habrechtstrabe 14, 71 Heilbronn/Neckar, and Hermann K. A. Glaser, 6522 Osthofen via Worms, both of Germany

Continuation-in-part of Ser. No. 884,698, Dec. 12, 1969, abandoned. This application Nov. 30, 1971, Ser. No. 203,218
Claims priority, application Germany, Dec. 12, 1968, 1814374
Int. Cl. H02p 1/40
U.S. Cl. 318—203 11 Claims



In a motor controlled fast spindle type impact press a motor controlling system, the motor being preferably of the umbrella construction type and being provided with a main motor winding and a retarding winding respectively, the motor windings being connected to an electric power supply (e.g., mains supply) via controlled thyristors for both running directions of the motor and the retarding windings being connected to the electric power supply via rectifier bridges, controlled by

thyristors whereby adjustment of the motor moments and retarding moments results in a precisely defined impact force together with a shortest possible impact time.

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**3,819,994**

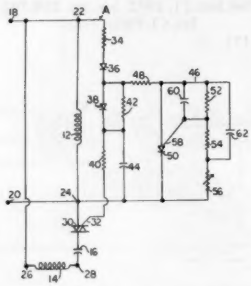
**TIME RESPONSIVE STARTING SWITCHES**

**Gray C. Ballman, 30 Portland Dr., St. Louis, Mo. 63131**

**Filed Mar. 14, 1973, Ser. No. 341,233**

**Int. Cl. H02p** *1/44*

**U.S. Cl. 318—221 E** **6 Claims**



I have invented an instantaneously resettable starting switch for use in single phase electrical motors which switch provides a capacitor to develop a d-c charge upon the application of external power to the motor, and utilizes the charge of said copacitor to supply power to the start winding of said motor for a finite period of time, after which time a time responsive control circuit discharges the capacitor instantaneously, separating the start winding from the external power, holding the start winding separated so long as external power continues to be supplied, and instantaneously resetting itself when external power is cut off.

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**3,819,995**

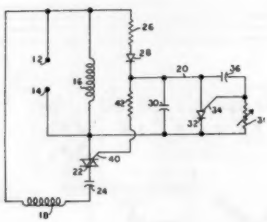
**TIME RESPONSIVE STARTING SWITCHES**

**Gray C. Ballman, 30 Portland Dr., Saint Louis, Mo. 63131**

**Filed Mar. 14, 1973, Ser. No. 341,234**

**Int. Cl. H02p** *1/44*

**U.S. Cl. 318—221 E** **7 Claims**



I have invented a resettable starting switch for use in single phase electrical motors which switch provides a capacitor to develop a d-c charge upon the application of external power to the motor, and utilizes the charge of said capacitor to supply power to the start winding of said motor for a finite period of time, after which time a time responsive control circuit discharges the capacitor instantaneously, separating the start winding from the external power, and holds the start winding separated through a capacitively controlled SCR so long as external power continues to be supplied, and which thereafter resets itself when external power is cut off.

**3,819,996**

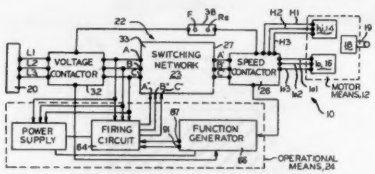
**MULTIPLE SPEED MOTOR CONTROL SYSTEM**

**Victor J. Habisohn, Chicago, Ill., assignor to Power Electronics International, Inc., Chicago, Ill.**

**Continuation-in-part of Ser. No. 29,869, April 20, 1970, Pat. No. 3,716,770. This application Aug. 28, 1972, Ser. No. 284,342**

**Int. Cl. H02p** *1/28, 1/38*

**U.S. Cl. 318—224** **66 Claims**




A power control system for driving a multispeed alternating current (AC) induction motor having at least a high speed mode and a low speed mode. Upon starting or reversing the direction of motor rotation or switching from one speed mode to another speed mode, the period for transferring electrical energy from a source to the motor is progressively increased from an initial time period to a greater time period of energy transfer per AC cycle.

Mechanical contactors may be used for connecting electrical voltage in a forward or reverse direction to the input of a static switching network and for connecting the high speed winding or low speed winding of the motor to the output of the switching network. Prior to making or breaking any of the connections of the contactors with the system, the static switching network is disabled to prevent energy transfer to the motor.

The system includes means for maintaining a minimum energy transfer from the source to the motor means for a predetermined time period, when decelerating from the high speed mode to the low speed mode.

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**3,819,997**

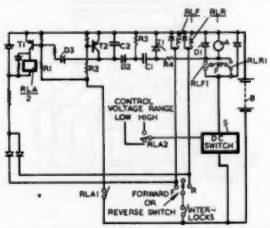
**CONTROL CIRCUITS FOR D.C. ELECTRIC MOTORS**

**John Morton, Hazel Grove; Keith Drummond Stevens, Marple, and Graham Spencer Thexton, Marple, all of England, assignors to Cableform Limited, Stockport, England**

**Continuation of Ser. No. 84,641, Oct. 28, 1970, abandoned. This application July 10, 1972, Ser. No. 270,055**

**Int. Cl. H02p** *3/08*

**U.S. Cl. 318—258** **5 Claims**




In the control of a reversible D.C. electric motor, such as is used in a battery operated vehicle, it is necessary that the applied current should be restricted, while the motor is running-on in a direction opposite to that newly selected i.e., during braking. The invention provides means for reliably determining when the motor has come to or passes through rest so that thereafter a full range of control current can be applied.

3,819,998

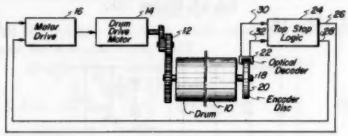
## DYNAMIC BRAKING CONTROL SYSTEM

Charles S. Yole, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 253,726, May 16, 1972. This application May 16, 1973, Ser. No. 360,718

Int. Cl. H02p 3/08

U.S. Cl. 318—277 17 Claims




A dynamic braking control system is provided for the angular positioning of a rotating device in a desired angular orientation. An encoder disc is mounted to rotate with the rotating device and a target area established at a predetermined location on the encoder disc. A logic circuit responds to determination of braking zone locations on the encoder disc for supplying dynamic braking signals to a drive motor employed for driving the rotating device. After the rotating device has stopped, the encoder disc is interrogated to determine whether the rotating device is in the predetermined angular orientation. If not, the rotating device is accelerated until the next braking zone is sensed.

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3,819,999

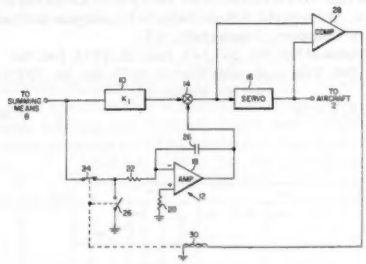
## CLOSED LOOP CONTROL SYSTEM INCLUDING AN INTEGRATOR AND LIMITING MEANS THEREFORE

Walter A. Platt, Fair Lawn, N.J., assignor to The Bendix Corporation, Teterboro, N.J.

Filed June 18, 1973, Ser. No. 371,223

Int. Cl. G05b 11/36

U.S. Cl. 318—609 7 Claims




A closed loop control system includes a saturable control element responsive to integrator and proportional commands. Means are provided for inhibiting or limiting the integrator command while allowing the proportional command when the control element is saturated, for increasing system stability.

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3,820,000

## METHOD AND TRANSFORMER/MOTOR FOR CHARGING BATTERIES

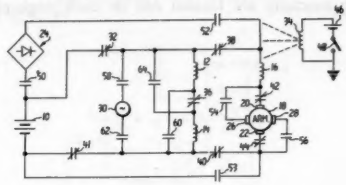
Stephen Hagar Smith, San Pedro, Calif., assignor to McCullough Corporation, Los Angeles, Calif.

Filed July 11, 1973, Ser. No. 378,046

Int. Cl. H02j 7/02; H02m 5/00

U.S. Cl. 320—2 32 Claims

Method and apparatus for utilizing the windings of a battery powered motor to charge the battery from an alternating current source. The effective electrical connection of the armature brushes is modified from a position encircling a minimum of the electromagnetic flux through the armature to a position encircling a maximum of the electromagnetic flux through the armature. The armature and field windings of the motor are



thereafter utilized as a transformer to inductively couple energy from the alternating current source to the battery to effect the charging thereof. A square motor case is preferred to reduce the resistance losses in the windings and to increase flux coupling. Brush friction losses are reduced as light loads by varying brush pressure as a function of load current.

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3,820,001

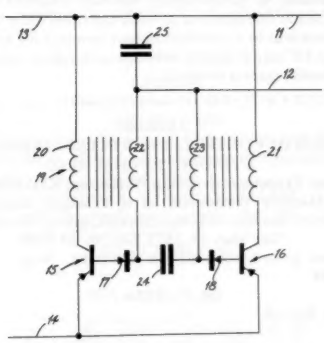
## TRANSISTOR POWER CONVERTER

Jan Van Valkenburg Schaefer, 2345 Seabreeze Dr., San Diego, Calif. 92139

Filed Feb. 28, 1972, Ser. No. 229,804

Int. Cl. H02m ; H03b

U.S. Cl. 321—2 3 Claims



A transistor power converter is described which may be used to convert a given direct current voltage to a higher direct current voltage. Transistor oscillator circuits are explained and illustrated which accomplish the desired power conversion. These circuits have certain advantages including low cost, small size, high efficiency, and low standby power requirements, that is, power is consumed by these power converters only when required by the electrical loads. Some of these circuits may be manufactured with as few as four electrical components. Specific examples of workable circuits are given.

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3,820,002

## NON-SATURATING AC/DC POWER SUPPLY

Theodore Wildi, Quebec, Canada, assignor to Lab-Volt (Quebec) Limited, Quebec, Canada

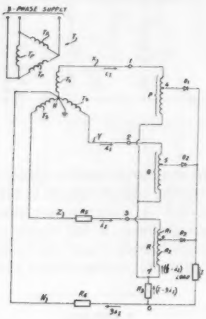
Filed Feb. 24, 1970, Ser. No. 13,432

Int. Cl. H02m

U.S. Cl. 321—5 5 Claims

An AC/DC power supply for use with a polyphase AC power source having a common neutral terminal comprising a

poly-phase autotransformer including star connected single-phase autotransformers, each single-phase autotransformer having one terminal adapted for connection to each phase of said polyphase AC power source, and a common neutral terminal adapted for connection to the common neutral terminal of the polyphase AC power source. Simultaneously movable tap connections are located one on each single-phase autotransformer, said tap connections dividing each single-phase autotransformer into two sections of varying ratio for providing a variable AC power supply. Similarly polarized diodes are connected at one terminal to eahh tap connection and at the other terminal to a common output terminal for providing a variable DC power supply between such output terminal and the common neutral terminal.



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**3,820,003**

## METHOD OF CONTROLLING A PULSE INVERTER FOR AN INDUCTION MACHINE

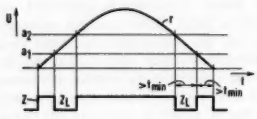
**Hermann Tappeiner; Hermann Waldmann; Karl-Heinz Bayer, and Manfred Wiebelzahl, all of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Berlin, Germany**

**Filed Mar. 13, 1972, Ser. No. 233,956**

**Claims priority, application Germany, Mar. 13, 1971, 2112186**

**Int. Cl. H02m** *7/00*

**U.S. Cl. 321—5** **7 Claims**



A method controls a pulse inverter for controlling the speed of induction machines such as asynchronous machines. To provide the control signals for the inverter, the point of intersection of a periodic reference curve whose frequency corresponds to the desired fundamental oscillation frequency of the output voltage of the inverter is provided with a determinable number (1 to *n*) of DC voltage levels ($a_1$ to $a_n$). The DC voltage level positions are controllable according to a desired rule or principle in dependence on a control voltage ($U_{St}$) whose level depends on the desired amplitude of the fundamental oscillation.

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**3,820,004**

## DIRECT CURRENT VOLTAGE SUPPLY APPARATUS

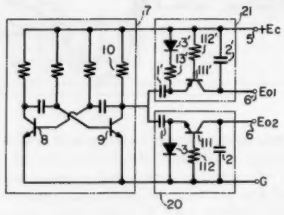
**Akio Sugiura, Nagoya, and Atsutoshi Okomoto, Toyohashi, both of Japan, assignors to Nippondenso Co., Ltd., Kariya-shi, Aichi-Ken, Japan**

**Filed Jan. 29, 1973, Ser. No. 327,389**

**Claims priority, application Japan, Feb. 2, 1972, 47-14004; Feb. 4, 1972, 47-15096; Mar. 8, 1972, 47-28235; Apr. 11, 1972, 47-43207**

**Int. Cl. H02m** *7/00*

**U.S. Cl. 321—15** **1 Claim**



A dc voltage supply apparatus comprising a dc power supply, a semiconductor switching circuit connected to the dc power supply, a first-capacitor charging circuit including a first capacitor and a first rectifying element and connected to the semiconductor switching circuit, a circuit including the first capacitor, a second capacitor and a second rectifying element and connected to the semiconductor switching circuit for discharging the first capacitor and charging the second capacitor, an output terminal connected to one end of the second capacitor, and a current limiter provided in at least one of the charging circuit and the charging and discharging circuit.

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**3,820,005**

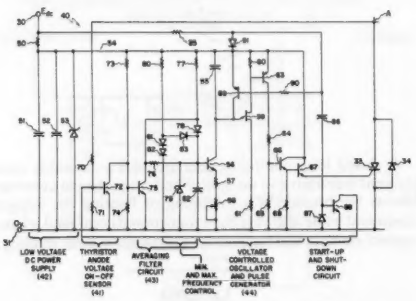
## INVERTER WITH CONSTANT DUTY CYCLE CONTROL

**Robert L. Steigerwald, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.**

**Division of Ser. No. 267,143, June 28, 1972, Pat. No. 3,781,505. This application Mar. 9, 1973, Ser. No. 339,913**

**Int. Cl. H02m** *7/52*

**U.S. Cl. 321—18** **5 Claims**


LOW VOLTAGE DC POWER SUPPLY (42)
THYRISTOR ANODE VOLTAGE ON-OFF SENSOR (41)
AVERAGING FILTER CIRCUIT (43)
MIN. AND MAX. FREQUENCY CONTROL
VOLTAGE CONTROLLED OSCILLATOR AND PULSE GENERATOR (44)
START-UP AND SHUT-DOWN CIRCUIT

An inverter for driving an induction heating coil utilizes a constant duty cycle control circuit to optimize performance with the load coupled with and removed from the energized coil. To compensate for the increased period of oscillation when unloaded, the inverter operating frequency is automatically decreased to reduce voltage and current stresses on circuit components. An on-off sensor continuously senses an in-

verter circuit parameter indicative of the load condition, such as a voltage divider and associated switch for sensing the thyristor anode voltage. The sensed information is processed by the control circuit in closed feedback loop manner to vary the thyristor gating signal repetition rate.

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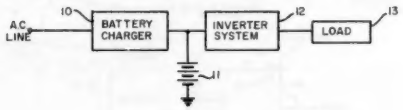
**3,820,006**

## POWER CONVERTER APPARATUS AND SILICON CONTROLLED RECTIFIER SWITCHING CIRCUIT THEREFOR

**Edward H. Phillips, Los Altos, Calif., assignor to Programmed Power, Inc., Menlo Park, Calif.**

**Filed Nov. 24, 1972, Ser. No. 309,161**
**Int. Cl. H02m** *7/52*
**U.S. Cl. 321—45 R** **20 Claims**




Power conversion apparatus utilizing high frequency controlled switching for converting an unregulated d.c. voltage to a.c. or controlled d.c. output voltages. The apparatus includes one or more programmed current switches for switching the current. The programmed current switches include a series pass silicon cotrolled rectifier (SCR) and one or more commutating SCR's and associated circuits. A control system integrates the input d.c. voltage, compares the voltage with a reference voltage, corresponding to the desired output, and generates firing voltages for the series pass and commutating SCR's to provide the desired output voltage. All SCR's are turned off with significant back bias, have controlled di/dt turn-on, and are subjected to controlled dv/dt upon the reapplication of forward voltage.

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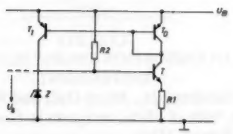
**3,820,007**

## MONOLITHIC INTEGRATED VOLTAGE STABILIZER CIRCUIT WITH TAPPED DIODE STRING

**Harald Schilling, and Wolfgang Hoehn, both of Freiburg, Germany, assignors to ITT Industries Inc., New York, N.Y.**

**Filed July 9, 1973, Ser. No. 377,477**
**Int. Cl. G05f** *3/14*
**U.S. Cl. 323—8** **5 Claims**



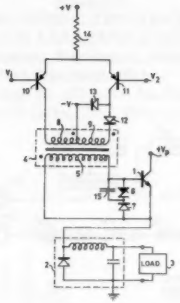
This relates to a monolithic integrated voltage stabilizing circuit containing a stabilizing chain of series connected diodes at the connection points of which several stabilized voltages are tapped. All stabilized voltages below the momentary value of the supply voltage are always present. Additional constant current source transistors form a multi-collector lateral pnp transistor.

**3,820,008**

## DRIVING CIRCUIT FOR SWITCHING TRANSISTOR

**Gianpiero Guarnaschelli, Milan, Italy, assignor to Honeywell Information Systems Italia, Caluso, Italy**

**Filed Dec. 26, 1972, Ser. No. 317,896**
**Claims priority, application Italy, Dec. 29, 1971, 33064/71**
**Int. Cl. H03k** *17/04;* **H02m** *3/32*
**U.S. Cl. 323—17** **3 Claims**




A circuit for controlling a floating voltage switch device employing a pulse transformer with separate primary, auxiliary and secondary windings. The windings are controlled by other portions of the circuit in such a way that when a current is supplied to the primary winding, the auxiliary winding is interrupted and vice versa. The circuit also includes a pair of series connected diodes which are in parallel with the auxiliary winding so as to permit the same to be fed only during a specified time interval.

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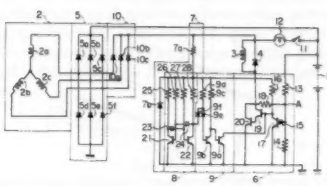
**3,820,009**

## VOLTAGE REGULATING SYSTEM FOR VEHICLE GENERATORS

**Katumi Itoh, Oobu; Kazumasa Mori, Chita, and Katsutaro Iwaki, Chiryu, all of Japan, assignors to Nippondenso Co., Ltd., Kariya-shi, Aichi-ken, Japan**

**Filed Dec. 12, 1972, Ser. No. 314,455**
**Claims priority, application Japan, Dec. 18, 1971, 46-102848; Feb. 8, 1972, 47-14207**
**Int. Cl. H02p** *9/30*
**U.S. Cl. 322—28** **4 Claims**

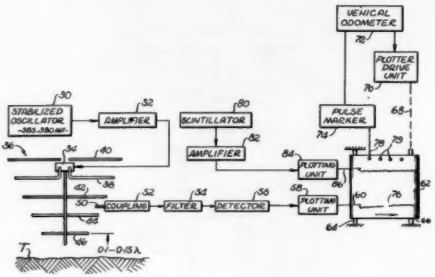


A voltage regulating system for vehicle generators of the type in which a voltage across the terminals of a battery is detected to thereby effect on-off control of the field current of an alternator for charging the battery in accordance with the detected voltage. The voltage regulating system includes a voltage control circuit for detecting the terminal voltage of the battery to effect on-off control of the field current, the on-off control action of said voltage control circuit having a hysteresis characteristic, and an astable multivibrator circuit connected to said voltage control circuit, whereby the duration of flow of the field current is always limited to less than one oscillation period of said multivibrator circuit, thereby effectively preventing oscillation from being caused in said voltage control circuit.

## 3,820,010
## SUBSURFACE CONTINUOUS-WAVE EXPLORATION SYSTEM

Gustav H. Sudmeier, 2708 Torrance Blvd., Torrance, Calif. 90503

Filed Mar. 11, 1971, Ser. No. 123,286
Int. Cl. G01n 27/78
U.S. Cl. 324—.5 R 7 Claims

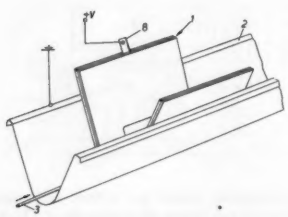



A system for providing data on the content of subsurface formations on the basis of the magnetic resonance of certain atomic structures of interest. The system incorporates a mobile unit for moving a source of directional electromagnetic radiation along the earth's surface, directing the radiation substantially vertically into the earth. A probe senses the energy content of the radiated energy pattern (including reflections) to detect distance-related changes which are indicative of groups of atom portions of interest. The sensed radiation is plotted along with a gamma radiation plot for an interpretation indicative of the subsurface formation content.

## 3,820,011
## FLUID IMMERSION CONDUCTOR INSULATION TESTER

Derek Charles Hoveman, Kenley, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed May 3, 1973, Ser. No. 356,854
Claims priority, application Great Britain, Aug. 18, 1972, 23434/72
Int. Cl. G01r 31/16
U.S. Cl. 324—54 5 Claims

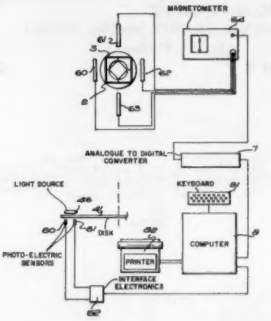


An electrode plate in the form of a V-shaped laminated trough is used for immersion testing of insulation around an electrical conductor. The center of the electrode is of bare metal while the other portions are insulated. The trough is filled with water through which the insulated wire conductor is passed. Voltage is applied between the electrode and ground via a lead connection at one end with the conductor being grounded at the extrusion machine. Pin holes in the insulation are detected by conduction between the wire conductor and electrode plate through the water.

## 3,820,012
## DETERMINATION OF THE ORIENTATION OF MAGNETISM IN A SAMPLE OF MATERIAL

Lindsay Molyneux, 4 Leazes Cres., Newcastle upon Tyne, England

Filed Apr. 13, 1972, Ser. No. 243,604
Claims priority, application Great Britain, Apr. 17, 1971, 9719/71; Apr. 17, 1971, 9720/71
Int. Cl. G01v 3/08; G01r 33/12; G01n 27/00
U.S. Cl. 324—14 9 Claims




A magnetic orientation estimator has flux sensitive magnetic pick-up heads carried around a sample locator. The locator preferably has a cube shaped rock sample holder, carried on a rotor which also carries a revolution detection means for indicating when a complete revolution of the sample is achieved and a series of position detection means for indicating predetermined angular increments of each of the samples. An analogue to digital converter is electrically connected to the pick-up heads for use with a computer. The computer is programmed to receive and store the digital information from the analogue to digital converter in a series of locations in a memory bank each corresponding to one of the predetermined angular positions. For each revolution the digital information for each angular position is added to the previously stored information in that memory location. The position detection means may comprise a series of slots in a disc carried on the rotor in cooperation with a photoelectric sensor. The revolution detection means may comprise a single slot on the same disc radially spaced from the series of slots and cooperating with a further photoelectric sensor. The computer is preferably programmed to analyze the wave form represented by the digital information and to store the results of the analysis in a further memory location. This procedure can be repeated for various positions of the sample and the results of each procedure can be combined to produce the final results.

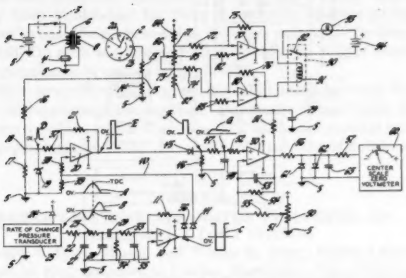
## 3,820,013
## INTERNAL COMBUSTION ENGINE IGNITION TIMING INSTRUMENT

Walter M. Gaudette, Jr., Royal Oak, and Philip K. Trimble, Rochester, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 16, 1972, Ser. No. 298,030
Int. Cl. F02p 17/00
U.S. Cl. 324—16 R 1 Claim

An operational amplifier circuit is responsive to an ignition signal, produced each time an ignition spark potential is generated for the reference cylinder of the engine, and to the zero crossover point, which occurs at the time the piston of the reference cylinder of the engine is at the top dead center position, of a square wave signal pulse produced by another operational amplifier in response to the single cycle alternat-

ing current compression signal output of a rate of change pressure transducer sensitive to the pressure within the reference cylinder for producing a series of timing angle signal pulses, each of a width equal to the period between the ignition signals and the zero crossover point of the square wave signal pulses. These timing angle signal pulses are averaged by a filter circuit network which produces a direct current potential output signal of a magnitude equal to the average of the timing angle signal pulses. This signal is compared with a direct current timing angle reference potential signal by a third operational amplifier which produces an output signal of a magnitude proportional to the number of degrees of the ignition spark advance or retard and a zero output signal when the ignition spark occurs at the selected number of degrees of ignition spark advance.

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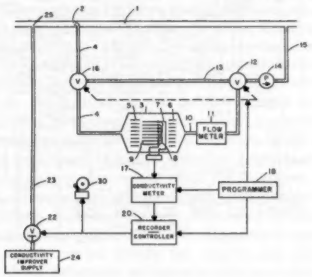
**3,820,014**

## CONDUCTIVITY MEASUREMENT SYSTEM

**William C. Ludt, Yonkers, N.Y., assignor to Ethyl Corporation, Richmond, Va.**

**Filed May 11, 1972, Ser. No. 252,474**
**Int. Cl. G01n** *27/42*
**U.S. Cl. 324—30 R** **4 Claims**




Disclosed herein is a system for measuring the electrical conductance of distillate hydrocarbon fuels during pipeline transport, comprising means for capturing a sample of the fuel from the pipeline in a test cell. The cell contains parallel guide vanes to minimize turbulence and a conductance probe comprising two high surface elements in spaced relationship. A potential is applied across the two elements and the signal generated by current flowing between them through the distillate fuel is amplified and measured on an ammeter calibrated in suitable conductance units. Also disclosed is an automatic programmer which continuously repeats the capture, measure and release signal, and a recorder which records the conductance values as a function of time. The system also includes an alarm to signal dangerously low conductivity and an automatic in-line blending device to add antistatic additive to the fuel in response to low conductivity readings.

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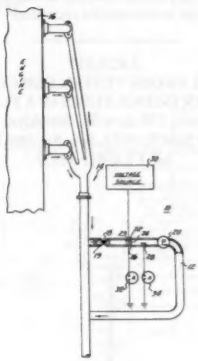
**3,820,015**

## SENSOR FOR MEASURING THE CONCENTRATION OF ONE GAS IN A MULTIPLE GAS SAMPLE

**Michele L. Jeunehomme, Farmington, Mich., assignor to The Bendix Corporation, Southfield, Mich.**

**Filed Aug. 30, 1972, Ser. No. 284,794**
**Int. Cl. G01n** *27/62*; **H01j** *37/00*
**U.S. Cl. 324—33** **5 Claims**




A sensor for measuring the concentration of oxygen in exhaust gas from an internal combustion engine in which a source of low energy beta electrons for ionizing oxygen molecules is disposed in a secondary exhaust conduit is illustrated herein. A constant volume pump moves exhaust gas through the secondary conduit at a predetermined rate. A collector plate is disposed downstream from the source of beta electrons, and a potential difference is maintained between the beta electron source and the collector plate so that oxygen ions separate from any other ions that might be produced and strike the collector plate. The charge on that plate is then measured to determine the concentration of oxygen in the exhaust gas.

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**3,820,016**

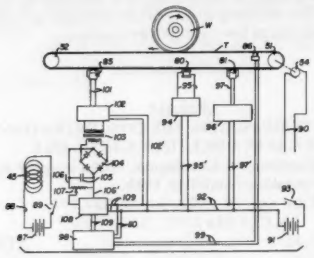
## METHOD AND APPARATUS FOR THE DETECTION OF CRACKS AND FLAWS IN RAIL WHEELS, RAILS AND THE LIKE BY SLIDING A PRERECORDED MAGNETIC MEDIUM OVER THE TEST PIECE

**Marion W. Gieskieng, 1333 S. Franklin St., Denver, Colo. 80210**

**Filed July 3, 1972, Ser. No. 268,921**
**Int. Cl. G01r** *33/12*
**U.S. Cl. 324—37** **14 Claims**

Apparatus for detecting and locating cracks and flaws at the surface of a magnetized member, and having special utility for detecting and locating cracks and flaws in railroad wheel rims and in rail heads. The member, such as a wheel rim or rail head, is first magnetized. A moving magnetic tape having an alternating magnetic carrier signal is then shifted across the surface of the member. Where the member is sound, this carri-

er signal will not be affected. However, whenever the tape moves over a crack or flaw at the surface of the member, the



carrier signal is disrupted. Thereafter, the tape may be moved through a readout apparatus and any disrupted portions of the carrier signal may be noted and/or recorded.

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**3,820,017**

**ELECTRICAL PROBE TESTER FOR CONTINUITY TESTING CARTRIDGE FUSES IN A FUSE BLOCK**

**William Reichenbach, 238 Java St., Brooklyn, N.Y. 11222**

**Filed June 8, 1973, Ser. No. 368,518**

**Int. Cl. G01r** *31/02*

**U.S. Cl. 324—51** **3 Claims**

A fuse tester has two probes which extend with offset projections from one end of a cylindrical insulating case, one probe being rotatably mounted so that the probe projections can span different sizes of fuses. The case contains two longitudinally displaced windows behind each of which a test bulb is secured in a loop formed by the fixed probe. One bulb is contacted by the rotatably mounted probe and the other bulb is contacted by a ground wire which extends from the end of the case opposite the probe projections. A resilient spacer within the case between the bulbs divides the case into two light tight compartments and it urges the bulbs apart to maintain their contacts with the ground wire and the rotatably mounted probe.

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**3,820,018**

**METHOD AND APPARATUS FOR LOCATING ELECTROMAGNETIC RADIATION IN THE VHF AND UHF RANGE FROM DIRECT OR ALTERNATING CURRENT ELECTRIC POWER LINES**

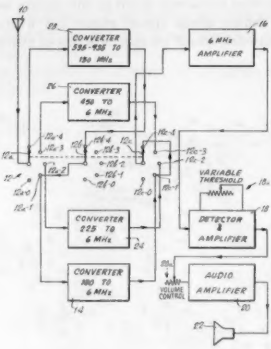
**William L. Beasley, and John P. German, both of Bryan, Tex., assignors to Research Corporation, New York, N.Y.**

**Filed Nov. 4, 1971, Ser. No. 195,720**

**Int. Cl. G01r** *31/08*

**U.S. Cl. 324—52** **4 Claims**

Method and apparatus for locating electromagnetic radiation from sparks on electric power lines carrying direct or alternating current. A receiver is provided that includes a variable threshold by which signals are detected only when they exceed the threshold. During a search for a noise source, as the




receiver is moved toward the source the threshold is raised to avoid detecting spurious noise signals from directions other than from the noise source being located.

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**3,820,019**

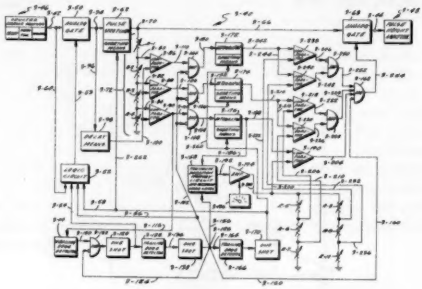
**PARTICLE STUDY APPARATUS INCLUDING AN AXIAL TRAJECTORY SENSOR**

**Edward Neal Doty, Miami, and Walter R. Hogg, Miami Lakes, both of Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.**

**Division of Ser. No. 142,531, May 12, 1971, Pat. No. 3,710,264, and a continuation-in-part of Ser. No. 132,771, April 9, 1971, Pat. No. 3,710,263. This application Jan. 5, 1973, Ser. No. 321,201**

**Int. Cl. G01n** *27/00*

**U.S. Cl. 324—71 CP** **13 Claims**



Apparatus for use with apparatus operating in accordance with the principles of the Coulter electronic particle studying device for differentiating between signals from particles passing on axial or near axial trajectories through an aperture and particles passing off center. The particle pulse duration is measured at two or more fractions of the amplitude for each individual particle pulse. These pulse durations so measured are converted into voltages which represent the respective durations of the several fractional amplitudes and are compared with certain reference voltages. The reference voltage for one fractional amplitude is derived from a memory circuit which remembers the duration at that same fractional amplitude for the smallest of prior pulses processed by the sensor. Using this information, a reference voltage is established for that one

fractional amplitude as the maximum permissible level below which the duration-representing voltage is acceptable and above which the duration-representing voltage is not acceptable. This same reference voltage derived from the memory circuit is used to establish maximum and minimum levels for the other fractional amplitude duration-representing voltages. In addition to the one duration-representing voltage falling below its reference level, the duration-representing voltages of all other fractional amplitudes must fall between the maximum and minimum reference voltages, respectively, which have been established for them in order to operate gating means to pass the particle pulse. All other pulses will be disregarded. On such account, pulses must have the proper shape and duration to be passed by the sensor.

Other structure operating on the relationship between the several durations of the fractional amplitudes of each pulse irrespective of the actual durations pass or discard particle pulses depending upon their shape only, independent of duration.

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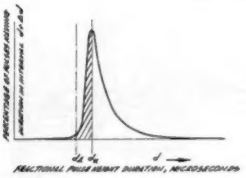
### 3,820,020
### PARTICLE STUDY APPARATUS INCLUDING AN AXIAL TRAJECTORY SENSOR

**Edward N. Doty, Miami, and Walter R. Hogg, Miami Lakes, both of Fla., assignors to Coulter Electronics, Inc., Hialeah, Fla.**

**Filed Jan. 8, 1973, Ser. No. 321,807**
**Int. Cl. G01n** *27/00*
**U.S. Cl. 324—71 CP** **10 Claims**




A sensor for use with apparatus operating in accordance with the principles of the Coulter electronic particle studying device for differentiating between particles passing on axial or nearly axial paths through the aperture of the Coulter device and particles passing off center. The particle pulse duration is measured at two or more fractions of the amplitude of each individual particle pulse. The pulse durations so measured are converted to voltages which are compared with reference voltages derived from similar measurements made on previously processed particle pulses. If the duration of the particle pulse being processed is within specified tolerances of the reference voltages so derived at all of the fractional heights considered, a reconstructed pulse having the amplitude of the accepted pulse is impressed upon the output of the sensor apparatus for use in subsequent pulse height analysis apparatus. All pulses which cannot satisfy the criteria are discarded. Since only those pulses are accepted which have their durations at specified fractional amplitudes which are within a specified tolerance of the reference voltage levels, the acceptance or rejection of a particle pulse is based upon the shape and duration of said particle pulse, as referred to the criteria derived from pulses occurring in the immediate past history of the train of pulses being furnished to the sensor apparatus. The apparatus of the invention provides structure for deriving a duration-measuring pulse at each fractional amplitude, converting this signal into one which has an amplitude proportional to each fractional height duration, and then subjecting the resulting set of signals to multiple criteria of duration established by voltage levels to operate gating means automatically for rejecting the pulses having improper shapes or durations as determined by these criteria.

A preferred embodiment uses as the said reference level a voltage level which represents a chosen percentile of the duration-measuring pulses, i.e., a voltage level such that, for instance, 25 percent of the duration-measuring pulses are smaller than, and 75 percent of the duration-measuring pulses are larger than the reference level.

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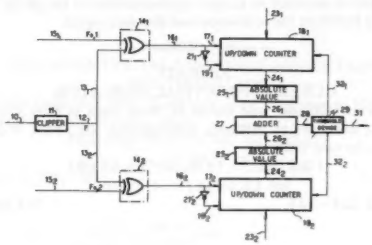
### 3,820,021
### SYSTEM FOR DETERMINING THE PRESENCE OF A GIVEN FREQUENCY IN AN INCOMING SIGNAL

**Christian Clarisse, Bailly, France, assignor to Electronique Marcel Dassault, Paris, France**

**Filed Apr. 9, 1973, Ser. No. 349,525**
**Claims priority, application France, Apr. 11, 1972, 72.12651**
**Int. Cl. G01r** *23/02, 23/14*
**U.S. Cl. 324—78 Q** **9 Claims**




An incoming signal wave, to be tested for the presence of a component of a predetermined frequency $F_o$, is converted into a square wave fed in parallel to a pair of "exclusive-OR" gates each also receiving a reference square wave of frequency $F_o$, the two reference waves being in quadrature with each other. The output of each gate is applied in noninverted form to a forward-counting input and in inverted form to a backward-counting input of a respective pulse counter stepped by clock pulses of a recurrence frequency substantially higher than $F_o$. The counts of both counters, converted to absolute values, are combined in an adder whose reading reaches a predetermined finite threshold value, starting from zero, only if there is substantial equality between the signal frequency and the reference frequency; in the absence of such equality, the random coincidences and noncoincidences of the compared square waves cancel each other in each counter.

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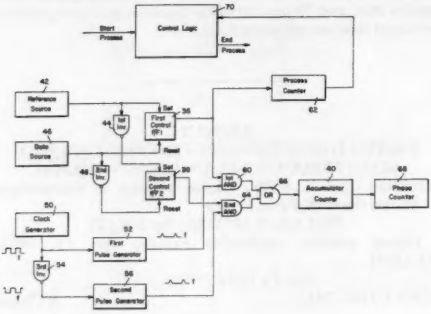
### 3,820,022
### ASYMMETRICAL WAVE DIGITAL PHASE MEASURING SYSTEM

**Richard E. Watt, San Diego, Calif., assignor to Cubic Corporation, San Diego, Calif.**

**Filed Sept. 28, 1972, Ser. No. 293,108**
**Int. Cl. G01r** *25/02*
**U.S. Cl. 324—83 D** **6 Claims**

The phase difference between two CW signals having the same frequency is distorted when the "zero" value of either or both of the signals shifts either in the relatively positive or negative direction, causing an asymmetrical wave. A system of dual clocks in which a first clock measures the phase between positive transitions of the data and reference signals and a

second clock measures the phase between negative transitions of the data and reference signals is incorporated. Both measurements occur singularly and/or simultaneously and are averaged to produce an output representative of the phase difference between the reference and the data signal.



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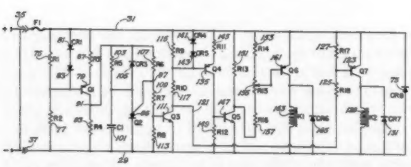
### 3,820,023
### CURRENT POTENTIAL INDICATOR

**Robert A. Williams, and David M. Holt, both of Fort Worth, Tex., assignors to Williams Instruments, Inc., Fort Worth, Tex., by said Williams**

**Filed Oct. 30, 1970, Ser. No. 85,693**
**Int. Cl. G01r** *19/14, 19/16*
**U.S. Cl. 324—133** **10 Claims**



A current potential indicator for connection with electrical contacts for detecting with a minimum event indicator the presence of a minimum electrical energy potential available at the contacts, and a threshold indicator for sensing a selected quantity of electrical energy above said minimum energy level. The apparatus is specially adapted for insertion into a pyrotechnic cartridge well or breech cap of a weapons system using pyrotechnically discharge weapons by utilizing a housing with retainer means for releasable connection with the well or breech cap. No electrical power supply is required for operation of this current potential indicator, thus producing essentially fail safe reliability.

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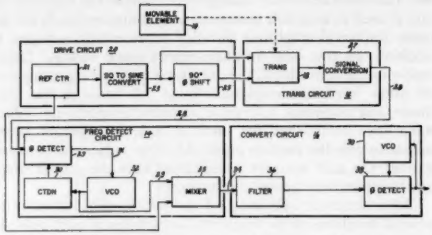
### 3,820,024
### ELECTRONIC VELOCIMETER

**Robert G. Wise, Loveland, and Harold D. Wiebe, Sharonville, both of Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio**

**Filed Aug. 23, 1972, Ser. No. 283,151**
**Int. Cl. G01p** *3/52*
**U.S. Cl. 324—165** **3 Claims**

An electronic velocimeter being readily adaptable for measuring the magnitude and direction of a velocity of a moving element. A transducer is responsive to the moving element and produces an output signal having frequency proportional



to the velocity of the moving element. A circuit is provided for measuring the variations in frequency and producing a DC output signal as a function thereof.

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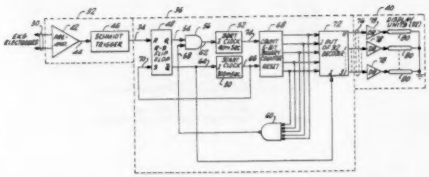
### 3,820,025
### METHOD OF APPARATUS FOR GENERATING AN R-INTERVAL HISTOGRAM

**Roy J. Lahr, Sierra Madre, Calif., and Roger A. Gruenke, Columbus, Ohio, assignors to Xerox Corporation, Stamford, Conn.**

**Filed Sept. 7, 1972, Ser. No. 286,980**
**Int. Cl. G04f** *9/00*; **A61b** *5/04*
**U.S. Cl. 324—182** **15 Claims**



A method and apparatus for automatically and directly generating a graphical data display, particularly an R-interval histogram, over a monitoring time period in which data is continuously received. The apparatus is portable and may be worn by a patient for relatively long time periods without impairing freedom of motion. As R-intervals are sensed, they are separated into ranges, or time-bins, and the signals in the time-bins are applied to arrayed electrochemical signal accumulating and displaying devices to directly generate a readable R-interval histogram. The electrochemical displays incorporate an overflow prevention scheme to prevent distortion of the histogram due to signal overflow.

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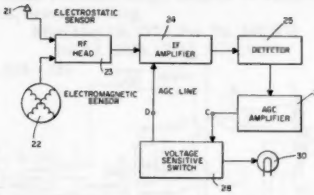
### 3,820,026
### MINIMUM RELIABLE SIGNAL INDICATOR FOR AIRCRAFT

**Norman A. Messinger, Center Square, Pa., assignor to Narco Scientific Industries, Inc., Fort Washington, Pa.**

**Filed May 17, 1972, Ser. No. 254,040**
**Int. Cl. G01s** *3/02*
**U.S. Cl. 325—364** **8 Claims**

Apparatus suitable for use in an aircraft receiver equipped with an automatic direction finding system for automatically providing an indication of the strength, relative to a threshold level, of the magnetic component a radio signal being received from a ground based station, comprising an adjustable voltage level detector connected to and monitoring the output of the automatic gain control circuit of the receiver, and producing a

bu bi-level output corresponding to whether the magnetic component of the received signals is above or below the threshold, the bi-level output being connected to and driving a suitable indicator so as to positively indicate sub-threshold received signals.

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**3,820,027**

## CIRCUIT ARRANGEMENT FOR AUTOMATIC STATION SEARCH

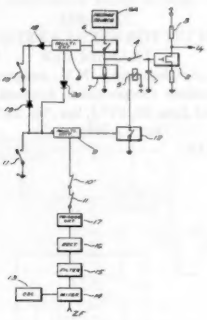
**Gerhard Maier, Schwenningen, Germany, assignor to SABA, Schwarzwalder Apparate-Bau-Anstalt Augurt Schwer Sohne G.m.b.H., Villengen, Germany**

**Filed Nov. 3, 1972, Ser. No. 303,607**

**Claims priority, application Germany, Dec. 3, 1971, 2160004**

**Int. Cl. H04b** *1/32*

**U.S. Cl. 325—470** **5 Claims**



A circuit arrangement for controlling tuning operations in a high frequency receiver employs a high impedance such as a field-effect transistor coupled between a capacitor and tuning varactors. The capacitor is connected via a relay contact, to either chassis ground or to a charging voltage source depending on the desired search direction. The relay is controlled by a first bistable multivibrator as a function of the state of a second bistable multivibrator. When a station signal is detected there is directed to the first multivibrator a pulse which is derived directly from said station signal. The relay is switched off, via a switching stage controlled by the first multivibrator, to thereby disconnect the charging capacitor from the source and stopping the tuning operation.

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**3,820,028**

## DIGITAL TONE SIGNAL GENERATOR

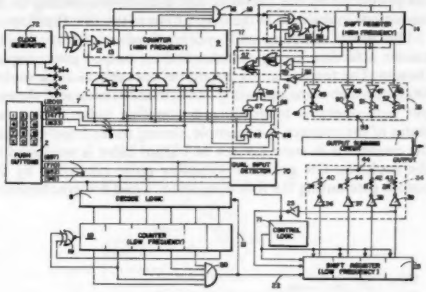
**James L. Thomas, 1520 Shasta Way, Placentia, Calif. 92670**

**Continuation of Ser. No. 175,524, Aug. 27, 1971, abandoned. This application Apr. 9, 1973, Ser. No. 349,161**

**Int. Cl. H03k** *1/16*

**U.S. Cl. 328—14** **10 Claims**

Counter circuits respond to depressed switches to generate two digital counts equivalent to audio frequency signals represented by a depressed switch. Digital output signals generated from the counts comprise substantially the fundamental frequency components of the desired audio frequency signals. The outputs are summed and processed to a transmission line.



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**3,820,029**

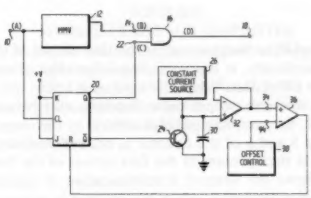
## PRECISION VOLTAGE CONTROL MONOSTABLE MULTIVIBRATOR

**Ronnie Jack McKinley, Longview, Tex., assignor to Halliburton Company, Duncan, Okla.**

**Filed May 15, 1973, Ser. No. 360,577**

**Int. Cl. H03k** *5/04*

**U.S. Cl. 328—58** **8 Claims**




A circuit for providing, when triggered, an output pulse of substantially constant amplitude and a duration linearly variable from zero to a predetermined maximum as a function of the amplitude of a control voltage variable from zero to a predetermined maximum. In the preferred embodiment, means are provided to produce a negative pulse of predetermined duration and a longer pulse having a duration equal to the sum of the predetermined duration and a duration related to the value of a control voltage. The two pulses are algebraically summed to provide an output pulse having a duration equal to the difference in duration and thus related solely in duration to the value of the control voltage.

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**3,820,030**

## PULSE SAMPLING AND SYNCHRONIZATION CIRCUIT

**Robert C. Williams, Churchville, Pa., assignor to GTE Information Systems Incorporated, Stamford, Conn.**

**Filed Sept. 5, 1973, Ser. No. 394,487**

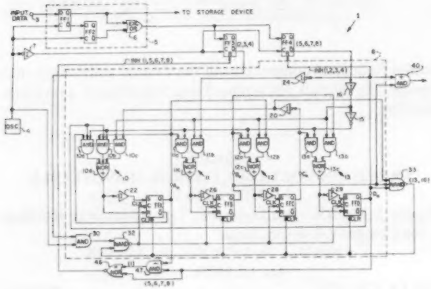
**Int. Cl. H03k** *1/00, 3/04*

**U.S. Cl. 328—63** **12 Claims**

A pulse sampling and synchronization circuit for producing sampling pulses synchronized with serial input data. Serial input data is applied to a data input of a first flip-flop which is clocked to reproduce the input data at a first output thereof. The first output of the first flip-flop is coupled to a first input

of an exclusive-OR gate and a second output thereof is coupled to a data input of a second flip-flop. An output of the second flip-flop is coupled to a second input of the exclusive-OR gate. When the two flip-flops are clocked, output pulses are produced by the exclusive-OR gate corresponding to the transitions in the data at the first output of the first flip-flop.

The pulse sampling and synchronization circuit also includes a feedback ring counter and an output gate coupled thereto. The feedback ring counter is operable to cycle repetitively through eight operating states in succession and the output gate operates to produce a sampling pulse during two states of the counter, for example, during states 5 and 6. When the counter is in state 1 when an output pulse is produced by the exclusive-OR gate, the sampling pulse produced by the output gate during the following states 5 and 6 is synchronized



with the bit of data then present at the first output of the first flip-flop, specifically, it has a leading edge aligned with the center of the bit of data. When the counter is in any one of the other states when an output pulse is produced by the exclusive-OR gate, the sampling pulse produced by the output gate during states 5 and 6 of the counter is not synchronized with the bit of data then present at the first output of the first flip-flop. To achieve the desired synchronization in accordance with the present invention, when the counter is in any one of states 2, 3, and 4 when an output pulse is produced by the exclusive-OR gate, the counter is caused to repeat its existing state; when the counter is in any one of states 5, 6, 7, and 8 when an output pulse is produced by the exclusive-OR gate, the counter is caused to skip a state. The desired synchronization is achieved after one or more cycles of operation of the counter.

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**ERRATUM**

For Class 328—71 see:
Patent No. 3,820,051

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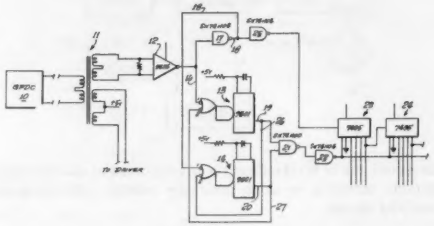
**3,820,031**
**METHOD AND APPARATUS FOR DECODING A MANCHESTER WAVEFORM**

**John R. Smithlin, North Hollywood, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.**

**Filed July 25, 1973, Ser. No. 382,412**
**Int. Cl. H03k** *13/00*
**U.S. Cl. 328—119** **6 Claims**

A circuit is disclosed and is used for the purpose of decoding trapezoidal serial waveforms of the Manchester waveform type which is generally a 6–36 bit trapezoid serial wave, or the like. The present circuit utilizes the zero crossovers of the waveforms to provide the decoding capability by initiating a



shift register clock pulse, and its circuitry is such that the zero crossovers at the beginning or end of each bit length are ignored.

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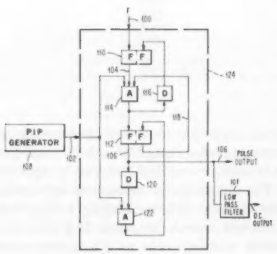
**3,820,032**
**DIGITAL CIRCUIT FOR USE AS A FREQUENCY-TO-DC TRANSDUCER**

**Hans P. Schlaeppi, Chappaqua, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.**

**Filed June 30, 1972, Ser. No. 267,809**
**Int. Cl. H03b** *3/04*
**U.S. Cl. 328—133** **4 Claims**



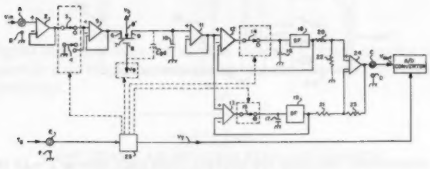
A digital system for converting the repetition rate (frequency) of an input signal into a proportional analog output signal, either in a single-ended or in a differential mode, is described. Basically, the system operates by generating exactly one square pulse for each recurrence of the input signal waveform. The duration of the output pulse is controlled by the repetition rate (frequency) of a timing source external to the frequency-to-DC converter, and the output amplitude is controlled by an external reference source. Thus, duration and amplitude of the output waveform are substantially independent of voltage and frequency fluctuations of the input signals, and of drifts in the converter circuit. Moreover, in the differential arrangement, drifts of the common external frequency and voltage references tend to cancel.

3,820,033

## MOS-FET SAMPLE AND HOLD SYSTEM FOR DIGITIZING HIGH FREQUENCY SIGNALS

Hideki Iwata, Portland, Oreg., assignor to Tektronix, Incorporated, Beaverton, Oreg.

Filed May 16, 1973, Ser. No. 360,876
Int. Cl. H03k 17/16, 5/20, 5/13
U.S. Cl. 328—151 17 Claims



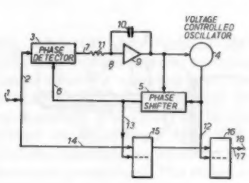
A MOS-FET sample and hold circuit to eliminate spike noise and offset voltage errors having single or difference sampling is provided.

3,820,034

## DIGITAL SIGNAL REGENERATORS

John Robin Ball, Ipswich, England, assignor to The Post Office, London, England

Filed Mar. 9, 1973, Ser. No. 339,723
Claims priority, application Great Britain, Mar. 14, 1972, 11774/72
Int. Cl. H03b 1/00
U.S. Cl. 328—164 6 Claims




A digital signal regenerator in which a local oscillator is synchronised with an incoming signal by means of a conventional second order phase locked loop, but the regenerated signals are timed by an oscillator controlled by the time integral of the error signals from the phase locked loop without any damping. In the described example a single oscillator is used and the linear damping term is introduced by means of a phase shifter effective on the oscillations from the oscillator to shift their phase by an amount dependent on the time integral of the error signal. In addition to a trigger circuit timing the regenerated digital signals, a second trigger is provided controlled by the phase shifted oscillations as a discriminator for receiving the input digital signals.

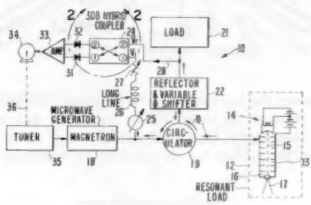
3,820,035

## MICROWAVE AUTOMATIC FREQUENCY CONTROL CIRCUIT

Gard E. Meddaugh, Mountain View, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed Feb. 26, 1973, Ser. No. 336,157
Int. Cl. H01j 23/00, 23/34
U.S. Cl. 328—233 9 Claims

The frequency of a microwave source, such as a magnetron of klystron, is locked to the variable frequency of a resonant load. A sample of the microwave power incident on the load is derived from the magnetron and compared in a phase comparator with a sample of the microwave energy reflected from the resonant load to derive an error signal representative of the frequency departure of the frequency of the microwave source from the resonant frequency of the load. The error signal is utilized for driving a tuner for tuning the frequency of the microwave source to the frequency of the load. In a preferred embodiment the phase comparator comprises a three db four port microwave hybrid coupler having a pair of



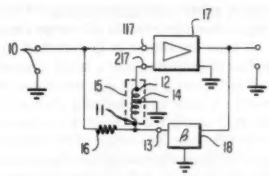

outputs, the outputs of which are rectified by microwave diodes and subtracted to produce the error signal. The length of the transmission path from the microwave source to the phase comparator circuit is made longer than the length of the transmission path from the microwave source to the load and back to the phase comparator circuit in order to skew the frequency discriminator output characteristic of the phase comparator in order to eliminate ambiguities in the sense of the error signal at frequencies far removed from the resonant frequency of the load.

3,820,036

## HYBRID FEEDBACK AMPLIFIER

Susumu Akiyama, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan

Filed Nov. 24, 1972, Ser. No. 309,372
Claims priority, application Japan, Nov. 26, 1971, 46-95536
Int. Cl. H03f 1/08
U.S. Cl. 330—28 12 Claims



A hybrid amplifier for connecting a signal carrying line to a repeater. The hybrid includes an autotransformer having a center tap dividing it into two portions. The signal carrying line, an amplifier section, a terminating resistor, and a feedback network are connected to the autotransformer in such a manner that the signal carrying line and the feedback network form a first conjugate pair and the amplifier section and the terminating resistor form a second conjugate pair.

3,820,037

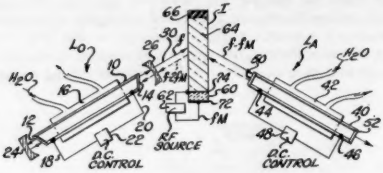
## LASER CONTROL SYSTEM

Vincent J. Corcoran, Orlando, Fla., assignor to Martin Marietta Corporation, New York, N.Y.

Filed Sept. 25, 1972, Ser. No. 291,844
Int. Cl. H01s 3/02
U.S. Cl. 331—94.5 C 5 Claims

A laser beam provided by a laser oscillator is transmitted along a path so as to be intercepted and amplified by a laser

amplifier. A portion of the laser beam may be reflected as a feedback signal to the oscillator and cause oscillator pulling. To prevent such unwanted feedback, an acousto-optical isolator is interposed between the amplifier and the oscillator




which causes the laser beam to be frequency shifted each time it passes through the isolator. The frequency shift is sufficient that the laser beam feedback signal arrives at the oscillator shifted in frequency by an amount to minimize oscillator pulling.

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**3,820,038**

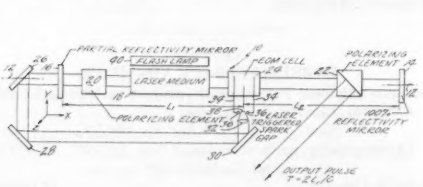
**METHOD AND APPARATUS FOR PRODUCING ISOLATED LASER PULSES HAVING A FAST RISE TIME**

**Richard G. Tomlinson, Glastonbury, Conn., assignor to The United States of America as represented by the United States Atomic Energy Commission, Washington, D.C.**

**Filed Feb. 9, 1973, Ser. No. 331,150**

**Int. Cl. H01s** *3/11*

**U.S. Cl. 331—94.5 Q** **6 Claims**




Disclosed herein is a laser oscillator system which provides laser pulses having a characteristically short rise time and high energy content. A laser oscillator is Q-switched to produce short duration pulses of radiation and a small amount of each pulse is tapped off to trigger a spark gap discharge in an electro-optic modulator. A pair of polarizing elements and the modulator are located along the axis of the optical cavity in the oscillator. With selective activation of the modulator, the polarizer elements interrupt the resonant reflections of the optical flux between the mirrors defining the oscillator and the Q-switched pulse energy is rapidly dumped from the cavity as fast rise time pulses.

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**3,820,039**

**ELECTRICALLY TUNABLE TUNED LINE OSCILLATOR**

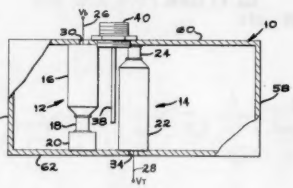
**Leland M. Farrer, San Jose, Calif., assignor to Systron Donner Corporation, Concord, Calif.**

**Filed Nov. 2, 1972, Ser. No. 303,280**

**Int. Cl. H03b** *7/14*

**U.S. Cl. 331—99** **7 Claims**

The disclosed embodiment of the present invention is a voltage tunable oscillator which includes a pair of tuning lines mounted transversely in a transmission line structure in parallel relationship to one another. One tuning line includes a Gunn diode and an inductive line section mounted in series with one another between opposite walls of the transmission line structure. The other tuning line includes a varactor diode and an inductive line section mounted in series with one another between opposite walls of the transmission line structure. The Gunn diode and varactor diode are mounted on opposite walls of the transmission line structure from one another. Suitable bias voltage is supplied to the Gunn diode and varactor diode. The spacing between the tuning lines is




substantially less than the spacing from each line to a wall of the transmission line structure which is parallel thereto. Accordingly, the tuning range of the oscillator is determined primarily by the distance between the tuning lines.

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**3,820,040**

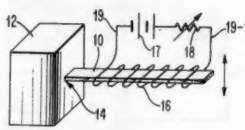
**USE OF MAGNETICALLY VARIABLE YOUNG'S MODULUS OF ELASTICITY AND METHOD FOR CONTROL OF FREQUENCY OF ELECTROMECHANICAL OSCILLATOR**

**Brian S. Berry, Ossining, and Walter C. Pritchet, Mahopac, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Dec. 30, 1971, Ser. No. 214,127**

**Int. Cl. H03b** *5/30*

**U.S. Cl. 331—156** **16 Claims**




Through the practice of this invention there is achieved control of the vibrational frequency of an electromechanical oscillator. This is achieved by utilizing the change in Young's modulus of elasticity which occurs for certain materials with applied magnetic field, known as the ΔE-effect. By selective annealing in the presence of specially directed magnetic field, the ΔE-effect is selectively altered along specific directions in the vibrational member. Additionally, by control of the ΔE-effect of a sonic delay line, there is achieved control of the delay time for an acoustic pulse propagating therein.

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**3,820,041**

**RESONANCE CONTROL IN INTERDIGITAL CAPACITORS USEFUL AS DC BREAKS IN DIODE OSCILLATOR CIRCUITS**

**James Walter Gewartowski, 2908 Edgewood, Allentown, Pa. 18103, and Isamu Tatsuguchi, R.D. 1 Chestnut Hill Rd., Center Valley, Pa. 18034**

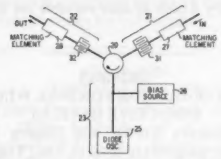
**Division of Ser. No. 283,984, Aug. 28, 1972, Pat. No. 3,764,938. This application Oct. 4, 1973, Ser. No. 403,720**

**Int. Cl. H01p** *1/32, 3/08;* **H03h** *13/00*

**U.S. Cl. 333—1.1** **10 Claims**

A modified stripline interdigital capacitor has slots coupled into the capacitor gap. These slots provide reactive loading to the slot transmission line formed by the gap. They are positioned and dimensioned to shift the frequency of the slot line

resonance so that it is out of a selected frequency band without affecting the capacitance of the structure. This inter-




digital structure may be used in diode oscillator circuits to provide a dc block for isolating the input and output from the diode bias.

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**3,820,042**

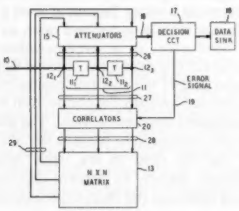
## FAST START-UP SYSTEM FOR AUTOMATIC TRANSVERSAL EQUALIZERS

**Kurt Hugo Mueller, Kuesnacht, Switzerland, assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.**

**Filed May 3, 1973, Ser. No. 356,957**

**Int. Cl. H04b** *3/04*

**U.S. Cl. 333—18** **9 Claims**




Method and apparatus for rapid initial setting in synchronous data transmission systems of transversal equalizer tap coefficients employ a weighting matrix in the tap-gain adjustment control loop, but not in any path which includes the signal being equalized. The values of the matrix elements are predetermined in accordance with the transmission characteristics of the distorting transmission medium and the type of signal processing employed. The effect is to reduce the settling or convergence time for initial equalizer training to two or three adjustments even in partial-response signaling systems.

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**3,820,043**

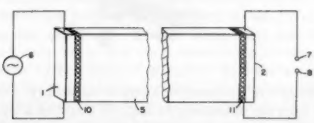
## MEANS FOR CONTROLLING IMPEDANCE CHARACTERISTICS OF ACOUSTIC DELAY LINE TRANSDUCERS

**Joseph W. Brouillette, Jamesville, and Edward M. Pruski, Syracuse, both of N.Y., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.**

**Filed June 12, 1973, Ser. No. 369,361**

**Int. Cl. H03h** *9/26, 9/30*

**U.S. Cl. 333—30 R** **1 Claim**



The exact thickness of the bond between the transducer and the delay line is established by the placing of metallic shims in the bonding material; therefore allowing control of the electrical impedance.

**3,820,044**

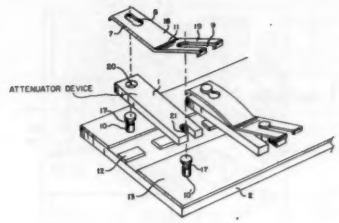
## CASCADE 50 OHM ATTENUATOR SYSTEM HAVING REMOVABLY MOUNTED ATTENUATOR DEVICES

**Kenneth C. Holland, Portland, Oreg., assignor to Tektronix, Inc., Tektronix Industrial Park, Beaverton, Oreg.**

**Continuation-in-part of Ser. No. 114,273, Feb. 10, 1971, Pat. No. 3,753,170. This application Mar. 5, 1973, Ser. No. 338,013**

**Int. Cl. G01p** *1/22*

**U.S. Cl. 333—81 A** **10 Claims**




In systems associated with high-frequency 50 ohm attenuators, means and methods are provided using hybird chips having circuitry thereon for electrical engagement on etched circuit boards thereby keeping electromagnetic fields between the etched circuit boards and the hybrid chips. Spring clips for maintaining the hybrid chips in position on the etched circuit boards and for maintaining electrical connection between circuitry on the hybrid chips and transmission mediums on the etched circuit board are provided.

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**3,820,045**

## DOUBLE-TUNED CIRCUIT DEVICE

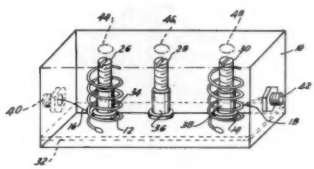
**Sadao Igarashi, Tokyo, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan**

**Filed Sept. 26, 1973, Ser. No. 401,054**

**Claims priority, application Japan, Nov. 20, 1972, 47-133687**

**Int. Cl. H03h** *9/00*; **H01f** *21/02*

**U.S. Cl. 333—70 S** **4 Claims**



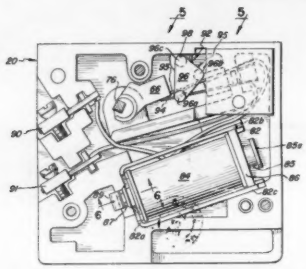
A double-tuned circuit device includes a housing, an input lead and an output lead, and a base plate having a conductive surface which is adopted to be received within the housing. A pair of resonator units are separately mounted on the base plate. Each of the units comprises a helical coil having a first end and a second end with a tap therebetween. An insulating cylinder is situated within the coil and mounted on the plate. A rod is movably received within the cylinder to permit adjustment of the resonant frequency of the unit. The tap of each of the units is connected to a different one of the leads and the first ends of each of the coils is connected to the conductive surface of the base plate. Means for adjusting the electromagnetic coupling coefficient of the units is provided comprising a third insulating cylinder mounted on the base plate between the units and a third rod movably received therein.

**3,820,046**

## AUXILIARY SWITCH FOR MOLDED-CASE CIRCUIT BREAKER

**Beryl W. Layton, and William J. Weaver, both of Cedar Rapids, Iowa, assignors to Square D Company, Park Ridge, Ill.**

**Filed Oct. 15, 1973, Ser. No. 406,729**
**Int. Cl. H01h** *71/46*
**U.S. Cl. 335—13** **5 Claims**



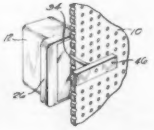
A molded-case circuit breaker is provided with a separate compartment containing an auxiliary switch. The switch may be constructed and arranged to be in an open condition when the circuit breaker is ON, and connected in series with a remote warning device activated upon tripping of the circuit breaker and closing of the switch, or it may be constructed and arranged to be in a closed condition when the circuit breaker is ON, and connected in series with a remotely energizable shunt trip coil provided in the separate compartment and deenergized upon tripping of the circuit breaker and opening of the switch.

**3,820,047**

## MAGNETIC ANNUNCIATOR OR SIGNAL DEVICE FOR CONTROL PANELS

**Paul B. Juhnke, Rt. No. 2, East Troy, Wis. 53120**

**Filed Feb. 12, 1973, Ser. No. 331,951**
**Int. Cl. H01f** *7/08*
**U.S. Cl. 335—229** **3 Claims**



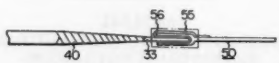
A miniature annunciator to be mounted on a control panel for determining the status of circuit conditions, remote machine operation, and general supervision has a housing in which is mounted a field reversible coil having at its each end a laterally extending pole piece. Pivoted within such housing on a shaft which extends outwardly from such housing is a permanently magnetized rotor. The axis of the shaft is located centrally between the two pole pieces and is approximately perpendicular to the flux path between the two pole pieces. The housing is provided with a flange by which it is held to the back of the control panel with the shaft extending through the panel. When the polarity of the coil is reversed, the rotor will be angularly moved approximately 90° from a position at one stop to a position at a second stop. The energizing of the coil is done by pulses and when the coil is de-energized, the permanent magnetism in the rotor will help keep it in the position attained by the energization of the coil. That part of the shaft protruding from the face of the panel is provided with a visible member, such as a bar, which is moved from a generally horizontal to a generally vertical position to indicate the condition of circuitry which is also variable on the face of the panel.

**3,820,048**

## SHIELDED CONDUCTOR FOR DISK WINDINGS OF INDUCTIVE DEVICES

**Kazuo Ohta; Kentaro Kurita, and Shigeru Morita, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan**

**Filed June 1, 1973, Ser. No. 366,146**
**Claims priority, application Japan, June 7, 1972, 47-56018**
**Int. Cl. H01f** *15/04*
**U.S. Cl. 336—70** **6 Claims**



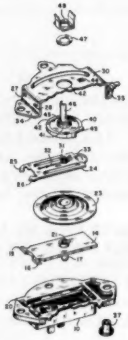
A shielded conductor used with disk windings for inductive devices characterized in that the disk windings comprise a plurality of coil units of conductive material wound in disk form, the disk windings having at least several coil units nearer to its external line terminal holding therein at least a winding of the shielded conductor with its inner end open so as to maintain the shielded conductor at a predetermined potential, a member material for regulating the electric field is connected to the open inner end of the shielded conductor, and an insulating layer is covered on both the connection and the member material for regulating the electric field. The member material for regulating the electric field permits the alleviation of concentration of electric field at the open inner end of the shielded conductor thereby to prevent dielectric breakdown between the coil units and the shielded conductor.

**3,820,049**

## CONDITION CONTROL APPARATUS

**Murrell F. Kautz, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.**

**Filed Oct. 11, 1973, Ser. No. 405,368**
**Int. Cl. H01h** *37/22*
**U.S. Cl. 337—319** **5 Claims**



A temperature responsive control assembly combination designed for ease of automatic assembly and in which the motion transducer is an expansible power vessel comprising a pair of flexible diaphragms welded together and containing within, a limited fill of a temperature responsive volatile fluid. The dual diaphragm is positioned between two relatively parallel lever arms, one lever arm being a unitary cover plate-

operator of the switch and the second lever arm being pivotally mounted into slots in the assembly outer frame. A helical cam mounted in the outer frame positions the second lever arm to provide a setpoint adjust. A threaded stud in the second lever arm provides for calibration.

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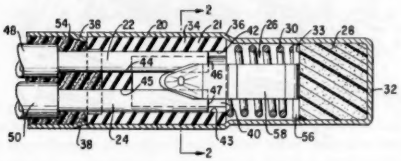
**3,820,050**
**THERMAL SWITCH**

**Hugh Jean Tyler; Denis G. Wolfe, both of Santa Ana, and Richard K. Mitts, Fullerton, all of Calif., assignors to Robertshaw Controls Company, Richmond, Va.**

**Filed July 13, 1973, Ser. No. 378,843**
**Int. Cl. H01h** *37/76*
**U.S. Cl. 337—408** **25 Claims**




A thermal switch has a pair of conductors with a longitudinally movable contact element engaging a side of at least one of the conductors and forming an electrical connection between the conductors. The contact element is biased against a thermally yieldable member such that when a predetermined temperature is reached the member yields and the element is moved longitudinally off an edge of the one conductor to open the electrical connection between the conductors.

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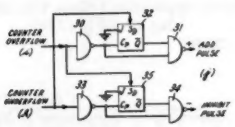
**3,820,051**
**ADAPTIVE THRESHOLD CIRCUIT EMPLOYING NAND GATES INTERCONNECTING FLIP-FLOP CIRCUIT**

**Charles McD. Puckette, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.**

**Division of Ser. No. 868,701, Oct. 23, 1969, Pat. No. 3,626,306. This application Apr. 21, 1971, Ser. No. 136,101**
**Int. Cl. H03k** *17/02, 19/36*
**U.S. Cl. 328—71** **2 Claims**

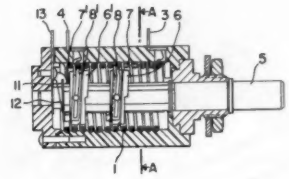



A method and circuit for synchronizing the receiver sampling pulse train with a received analog data waveform in the receiver analog-to-digital converter in a synchronous data communication system utilizes the average time of occurrence of the zero slope points of the received waveform to obtain the synchronous condition. A zero slope detector detects the points of zero slope and each detected zero slope passes a clock pulse of repetition rate higher than the sampling pulse train rate to an up-down counter. The receiver time base in square waveform controls the count direction of the counter, and successively repeated overflows (or underflows) of the counter add (or inhibit) single pulses to a digital phase shifter which shifts by a small fractional period the receiver time base waveform and the sampling pulse train in the proper direction for synchronization with the received analog data waveform.

**3,820,052**
**POTENTIOMETER**

**Johann Gruendinger, Landstr. 1, 8021 Arget, Tegernseer, Germany**

**Filed Jan. 17, 1973, Ser. No. 324,383**
**Claims priority, application Germany, Jan. 25, 1972, 2203431**
**Int. Cl. H01c** *5/02*
**U.S. Cl. 338—97** **8 Claims**




A potentiometer having a resistor which can be adjusted to a desired value by establishing a short circuit between portions of the resistor. The resistor has terminals on both ends. A slider contact which is electrically connected to a slider terminal contacts the resistor and short circuits a portion of the resistor. The slider contact is movable with respect to the resistor. In one embodiment, the slider contact comprises two, spaced-apart, electrically-connected, slider springs carried on a rotatable shaft positioned within a spiral resistor.

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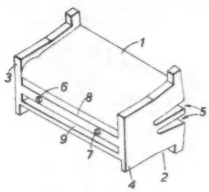
**3,820,053**
**ELECTRICAL CONNECTOR**

**Michael John Champion, and Robert William Donnelly, both of Basingstoke, England, assignors to ITT Industries, Inc., New York, N.Y.**

**Filed Oct. 2, 1972, Ser. No. 294,166**
**Claims priority, application Great Britain, Oct. 26, 1971, 494623/71**
**Int. Cl. H05k** *1/02*
**U.S. Cl. 339—17 F** **8 Claims**

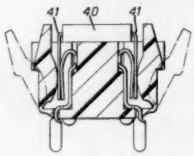



An electrical connector for connecting conductors mounted on a panel extending into a slot therethrough to those of a flat cable. The cable with one or more conductors bare is wrapped around an insulator. A rectangular block having a rectangular hole therethrough is pressed over the cable and insulator to stop projections on the latter. A portion of the insulator with the cable wrapper therearound which is exposed by the block on the side thereof opposite the side engaged by the projections is then press fit in the panel slot with the panel conductors in pressure and electrical contact with the cable conductors. Clips engageable with the panel can be snap fit over the plate to hold it and the cable in place in the slot.

## 3,820,054
## ELECTRICAL SOCKETS

**Antony Brasher Clewes, Sherwood, and Denis William Tuckwood, Beeston, both of England, assignors to TRW Inc., Cleveland, Ohio**

**Filed Nov. 2, 1972, Ser. No. 308,245**
**Claims priority, application Great Britain, Nov. 19, 1971, 53843/71**
**Int. Cl. H05k** *1/04*; **H01r** *13/62*
**U.S. Cl. 339—17 CF** **25 Claims**



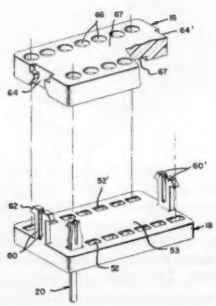

An electrical connection socket for securing to a printed circuit board and enabling connection of a DILIC package with electric circuits of that board includes on a base member socket contact members arranged to receive adjacent them plug contact members of the DILIC package, side members hinged on the base member and movable from baised non-operative positions to operative positions in which they press together associated socket and plug contact members to provide good electrical contact therebetween, and end members hinged on the base member and biased to locking positions in which they retain the side members in their operative positions when closed to those positions.

The base member, the side members and the end members are moulded integrally with one another from an electrically-insulating plastics material.

## 3,820,055
## MULTI-CONTACT CONNECTOR AND CONTACT TERMINAL FOR FLAT CABLE

**Clifton Wesley Huffnagle, Camp Hill, Pa., and Henry George Wasserlein, Jr., Seminole, Fla., assignors to AMP Incorporated, Harrisburg, Pa.**

**Filed Nov. 14, 1972, Ser. No. 306,470**
**Int. Cl. H05k** *1/04*
**U.S. Cl. 339—17 F** **14 Claims**

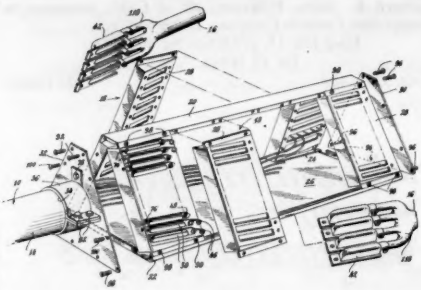



Multi-contact connector for flat cable comprises base member and cap piece which are assembled to the cable. Wire-in-slot type electrical contact terminals mounted in the base member engage the conductors of the cable and establish electrical contact therewith. Contact terminals each provide redundant contact to the conductors and engage the cap member in a manner which maintains electrical contact and secures the cap member to the connector.

## 3,820,056
## METHOD AND APPARATUS FOR CONNECTING MULTI-CONDUCTOR CABLES

**George Edward Ayer, Endicott, N.Y., assignor to Bunker Ramo Corporation, Oak Brook, Ill.**

**Filed Apr. 28, 1972, Ser. No. 248,595**
**Int. Cl. H01r** *11/02*
**U.S. Cl. 339—22 R** **4 Claims**

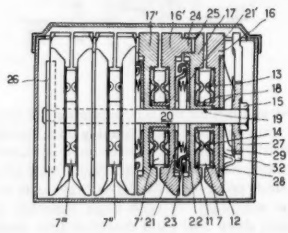


A method and apparatus for connecting multi-conductor cables is provided. The apparatus consists of an assembly having at least three panels, one of which is a base plate and at least two of which have first connector elements mounted in them. The plates are joined to form an enclosure, preferably of a delta shape, for a first multi-conductor cable. Each of the first connector elements has a selected group of first cable conductors connected to it. There are a plurality of second connector elements which are adapted to mate with the first connector elements with each of the second connector elements being connected to a selected group of conductors of one or more second cables. Apparatus is provided which is operative when the connector elements are mated for preventing the elements from being spuriously separated, but for permitting the elements to be separated if desired. Additional panels may be modularly added to the assembly to form an enclosure for cables having a greater number of conductors.

## 3,820,057
## BUSWAY CONNECTOR

**Jean Joly, Houilles, France, assignor to La Telemecanique Electrique, Monterre, France**

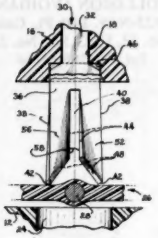
**Filed Feb. 9, 1973, Ser. No. 331,267**
**Claims priority, application France, Feb. 22, 1972, 72.05834**
**Int. Cl. H01r** *13/60*
**U.S. Cl. 339—22 B** **4 Claims**




Fish device for the electrical joining of conductors. The ends of the bars are pinched between contact plates simultaneously subjected to a well-distributed flexible compressive force developed along an axis on which they are stacked and limited in size by a sliding system.

The device is applied to electric current-distributor cables containing bus-bars.

3,820,058
**INSULATION PIERCE TYPE CONNECTOR**
Lindsay C. Friend, Camp Hill, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed Oct. 4, 1972, Ser. No. 294,766
Int. Cl. H01r *13/38*
U.S. Cl. 339—99 R 18 Claims



A pierce type connector for a ribbon cable or the like having a body and a pair of contact tines extending from the body. The tines diverge laterally of each other away from the body. The tines have insulation pierce tips at the free ends and include conductor engaging corners diverging outwardly of the body. The terminals pierce the ribbon cable insulation and expose the conductors therein for contact with the conductor engaging corners.

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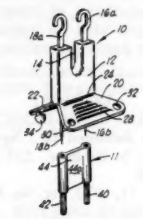
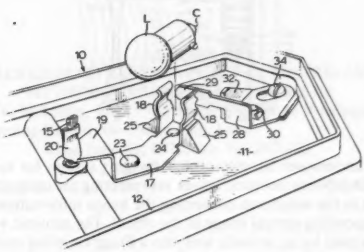
3,820,059
**QUICK CONNECT TERMINAL APPARATUS AND DEVICE FOR PROVIDING TERMINALS AND SPLICES ON COAXIAL CABLE LEADS**
Harry L. Gibbons, 12601 S. 156 East, Draper, Utah 84020
Filed Jan. 10, 1973, Ser. No. 322,427
Int. Cl. H01r *7/04*
U.S. Cl. 339—100 10 Claims



A quick connect terminal and splicing device for rapidly effecting connection of a terminal or another coaxial cable to the raw end of a coaxial cable, the device including a body having embedded therein, a pair of spaced, metal conductor elements. A pair of flexible clamp jaws project from one side of the body, and the metal conductor elements embedded in the body each have end portions formed as elongated contact pins which project from the body between the clamp jaws. Similar clamp jaws and contact pins are provided at the opposite side of the body when the device of the invention is to be used for splicing coaxial cable. Alternatively, the metal conductor elements embedded in the body may be projected from the body on the opposite side thereof from the contact pins as a pair of metal tie hooks which can be utilized for quickly and easily attaching the device of the invention to the screw type contact terminals provided on an electronic device, such as a television set. The clamp jaws include means allowing them to be interlocked in flatly abutting relation to each other to clamp between them the end of a coaxial cable.

3,820,060
**LAMP HOUSING AND ELECTRICAL TERMINAL CONSTRUCTION**
John Smith, 505 Cummer Ave., Willowdale, Ontario, Canada
Continuation-in-part of Ser. No. 214,595, Jan. 3, 1972, abandoned. This application Mar. 7, 1973, Ser. No. 339,378
Int. Cl. H01r *9/08*
U.S. Cl. 339—220 L 10 Claims



A lamp housing comprising a base and a transparent wall. The base includes an axial opening through which an electric wire extends. A first terminal is mounted in the base and has a socket forming portion for receiving a bulb and another portion that is axially aligned with the opening and deformed into electrical contact with the end of the wire that extends through the opening. A second terminal is fixed to the base and has a portion contacting the central electrical contact of a bulb. Electrical connections are made to the second terminal by an electrically conductive screw that extends through the second terminal and an opening in the base to the exterior.

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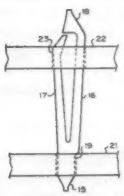
3,820,061
**CONNECTOR FOR PRINTED CIRCUIT BOARDS**
Thomas E. Holden, Santa Cruz, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Sept. 5, 1972, Ser. No. 286,490
Int. Cl. H01r *11/22*
U.S. Cl. 339—252 6 Claims



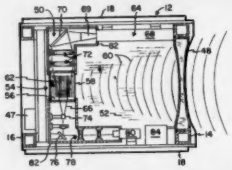
A connector for providing mechanical support and electrical contact between two printed circuit boards, or between an electrical component and a printed circuit board includes a base, two contact members, and a guide tip. A plurality of the connectors may be aligned by one or more removable tabs until assembly or encapsulation.

3,820,062

## ACOUSTO-OPTICAL UNDERWATER IMAGING SYSTEM

Pravin G. Bhuta, Torrance; Robert Aprahamian, Marina Del Rey, and Jerold L. Jacoby, Lakewood, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed Jan. 2, 1973, Ser. No. 320,130
Int. Cl. G01s 9/66
U.S. Cl. 340—3 R 21 Claims



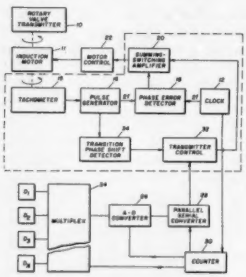
An underwater acousto-optical imaging system for receiving water-borne acoustic waves representing an image of an object in the water and converting the image information to a corresponding optical image of the object. The acoustic waves are focused by an acoustic lens into a Bragg coupling medium wherein a monochromatic light beam is Bragg diffracted by the acoustic waves to produce a modulated light side band defining the optical image. A television camera converts this optical image to electrical signals for viewing of the image at a remote video monitoring station. The imaging system may be driven in a scanning motion for operation in a search made and may include an acoustic source for generating acoustic probing waves which reflect from objects in the water back to and are converted to optical images by the imaging system.

3,820,063

## LOGGING-WHILE-DRILLING ENCODER

James H. Sexton, Duncanville; Bobbie J. Patton, Dallas, and John W. Harrell, Duncanville, all of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 12, 1973, Ser. No. 340,137
Int. Cl. G10v 1/40
U.S. Cl. 340—18 LD 15 Claims



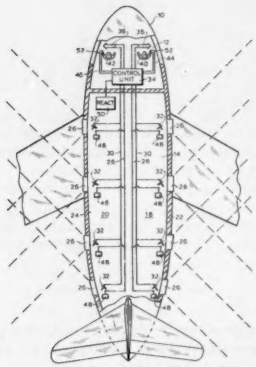
In a logging-while-drilling system motor speed is changed in order to change the phase of an acoustic signal between two phase states. In carrying out a change in phase state, a step voltage is initially applied to a motor control circuit. Added to the step voltage is a linearly increasing voltage. The amount of phase shift in the acoustic signal is detected, and upon the occurrence of a predetermined phase shift the voltage applied to the motor control circuit is reduced to a lesser value. The application of the voltage of lesser value is continued for a predetermined time at which the acoustic signal will have substantially attained the other phase state. The rotary valve driven by the motor imparts a high degree of phase coherence to the acoustic signal which it generates. Rotation of the motor is phase locked to a highly stable clock in near optimal manner by sampling the phase error between the clock and the motor angular position reference every half period of the acoustic signal.

3,820,064

## AIRCRAFT COLLISION AVOIDANCE SYSTEM

Rolland D. Truitt, 2925-N.W. 14th Pl., Gainesville, Fla.

Filed Feb. 23, 1973, Ser. No. 335,053
Int. Cl. G08g 5/04
U.S. Cl. 340—25 6 Claims



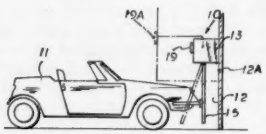
A mid-air collision avoidance system for a passenger aircraft, including a passenger-actuated switch providing an input to an indicator in the cockpit, to warn the flight crew of an impending collision threat or other avoidable circumstance. Means are provided to indicate crew member acknowledgment of the passenger activated signal.

3,820,065

## PARKING AID DEVICE

Joseph Koplewicz, 42 Bellwood Dr., New Hyde Park, N.Y. 11040, and Stanley S. Brenner, 237 Joludow Dr., Massapequa, N.Y. 11758

Filed Dec. 11, 1972, Ser. No. 313,688
Int. Cl. G08g 1/14
U.S. Cl. 340—51 3 Claims

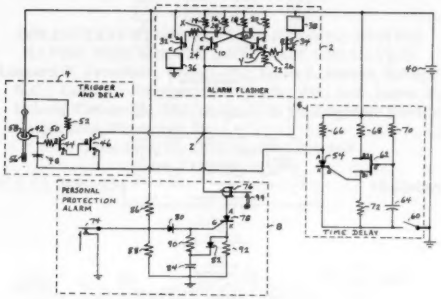


An electrically operated parking indicator to indicate the proper position of a vehicle, e.g., in parking a vehicle in a garage. The parking indicator includes a signaliing means, e.g., a light bulb which is actuated when the vehicle is properly positioned, and which signal is automatically de-energized upon the lapse of a predetermined time interval.

## 3,820,066
## BURGLAR AND PERSONAL PROTECTION ALARM FOR VEHICLES

**Franklin B. Kennell, 151 N. Parkway, Riverhead, N.Y. 11901**

**Filed Nov. 24, 1972, Ser. No. 309,262**
**Int. Cl. G08b** *13/00*; **B60r** *25/10*
**U.S. Cl. 340—65** **8 Claims**

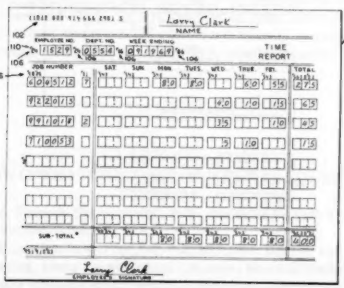



An alarm flasher on a vehicle is triggered by an inertial trigger for a predetermined time interval after the trigger is disturbed. The trigger is activated only after a predetermined amount of time has passed since a manual switch is operated. A personal protection alarm manually actuates the flasher and is disabled at a remote location.

## 3,820,067
## CHARACTER READING SYSTEM CONTROLLED BY PREPRINTED PROGRAM CONTROL CHARACTERS ON DOCUMENT FORM

**David H. Shepard, Rye, N.Y., assignor to Cognitronics Corporation, Mt. Kisco, N.Y.**

**Continuation of Ser. No. 876,694, Nov. 14, 1969, abandoned, which is a continuation-in-part of Ser. No. 701,670, Jan. 30, 1968, Pat. No. 3,582,884. This application Aug. 18, 1971, Ser. No. 172,924**
**Int. Cl. G06k** *7/14*
**U.S. Cl. 340—146.3 B** **1 Claim**

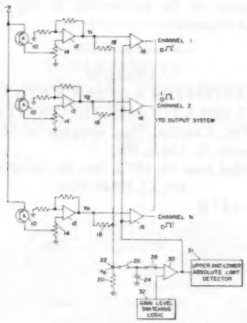



An optical character recognition system including a laser scanner unit adapted to scan a document having preprinted markings to indicate where the characters are to be placed. Variations in light intensity reflected from the document and characters produce scan signals which are processed to determine the characters. The color of the markings on the document is related to the laser frequency such that the light reflected from the markings has the same intensity as the light reflected from the document background, so that the presence of the markings does not interfere with the reading of the characters.

## 3,820,068
## BACKGROUND REFERENCE LEVEL SYSTEM AND METHOD FOR DOCUMENT SCANNERS

**John V. McMillin, Iowa City, Iowa, assignor to Westinghouse Learning Corporation, Iowa City, Iowa**

**Filed June 29, 1972, Ser. No. 267,471**
**Int. Cl. G06k** *5/00*
**U.S. Cl. 340—146.3 AG** **12 Claims**




A self-checking system for electronic document scanners of the multiple data channel type that detect data in the form of pencil marks on the document. The data channels are used to measure the reflectance level of the document background immediately before any data marks are presented for detection, and the output of the channels are averaged to arrive at a background level. This background level is then used as a reference level for reading the marks. With this system, maximum sensitivity in all data channels is attained thus allowing optimum discrimination in detecting marks in the data area of the document. This background level is also used to automatically check the performance of the system so as to identify any malfunctions in the system or any variance in individual channels beyond predetermined limits.

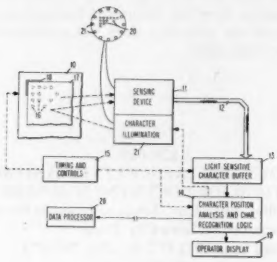
## 3,820,069
## ELECTRO-OPTICAL READ SYSTEM

**Neil N. Krewson, and John B. Tait, Vestal, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Dec. 26, 1972, Ser. No. 318,075**
**Int. Cl. G06k** *9/04*
**U.S. Cl. 340—146.3 H** **12 Claims**

An electro-optical read system utilizing a position generating tablet, a handheld sensing device for reading the data from a source document and employing a fiber optic bundle to transmit the data representing signals to an associated unit

that contains the data buffers, data recognition and logic circuitry, power supplies, and other related equipment. The read




operations can be performed in a random manner without requiring a scan to be performed in any prescribed or predetermined sequence.

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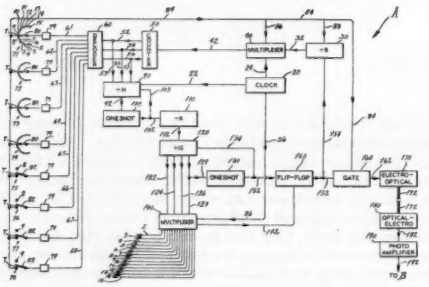
**3,820,070**

## CONTROL SYSTEM FOR A DERRICK UTILIZING LIGHT MULTIPLEX COMMUNICATION LINK

**Charles W. Fox, Clayton, Mo., assignor to McCabe-Powers Body Company, St. Louis, Mo.**

**Filed June 16, 1972, Ser. No. 263,648**
**Int. Cl. H04b 9/00**
**U.S. Cl. 340—147 R** **61 Claims**



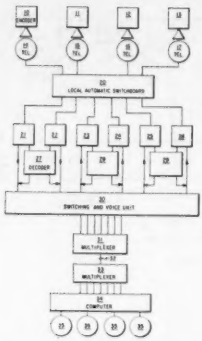

A remote control system for a derrick, having an encoder network for producing a plurality of differing electrical control signal frequencies at one location on the derrick and a discriminator network at a second location on the derrick for identifying each electrical control signal frequency produced by the encoder network. An electro-optical converter communicates with the encoder to covert electrical control signal frequencies to analogous light signal frequencies. A light tube communicating with the electro-optical converter transfers the light signal frequencies from the electro-optical converter to an optical-electro converter that communicates with the discriminator and reconverts the light signal frequencies back to their corresponding electrical control signal frequencies. The discriminator communicates with a plurality of output networks that correspond to operating members of the derrick and directs an identified control signal frequency to the output network associated with that frequency.

**3,820,071**

## CREDIT CARD RISK EVALUATION SYSTEMS

**David R. Angus, R.D. 1-463 Old Reaville Rd., Flemington, N.J. 08822**

**Continuation of Ser. No. 667,764, Sept. 14, 1967, abandoned. This application June 19, 1970, Ser. No. 48,931**
**Int. Cl. H04q 9/00; H04m 11/08**
**U.S. Cl. 340—149 A** **6 Claims**




A system including an automatic credit card reader and tone transmitter for transmitting identification of a credit card to a tone decoder and transmitter for retransmission to a computer at which the credit rating is determined, and from which an appropriate signal is retransmitted to an audio recording unit whereby the system selects the appropriate audio message for presentation to the person interrogating the system. A timing circuit releases equipment upon conclusion of a response by the system. Protection from spurious signals and circuits for checking of signals for the accuracy are employed.

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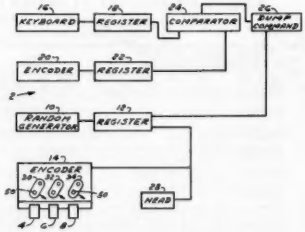
**3,820,072**

## AN IDENTIFICATION SYSTEM

**Alvin S. Blum, Coral Gables, Fla., assignor to Products International Incorporated, Fort Lauderdale, Fla.**

**Division of Ser. No. 789,052, Dec. 31, 1968. This application Mar. 16, 1971, Ser. No. 126,255**
**Int. Cl. H04q 5/00**
**U.S. Cl. 340—149 A** **3 Claims**




An identification system including a card preparation system, a memory system, remote card reading stations, a comparator, accessory device, and a control means connected between each of said items. The card preparation system records distinct patterns on identification cards. The control means directs the operation of the information retrieval system. The memory system stores identifying information characteristics as well as distinct coded patterns that are placed on the cards. The remote card reading stations provide

relative movement between the card being read and the reading head in the station in order to generate a train of electrical impulses. The comparator compares the train of electrical impulses from a remote station and a train of electrical impulses from the memory system. The comparator signals a match or mismatch to the control means in order to operate various accessory devices.

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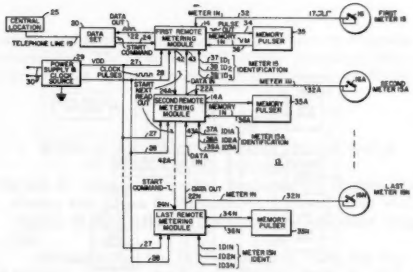
### 3,820,073
### SOLID STATE REMOTE METER READING SYSTEM HAVING NON-VOLATILE DATA ACCUMULATION

**Leonard C. Vercellotti, Verona, Pa.; James S. Britton, Raleigh, N.C.; Louis G. Ottobre, Murrysville, Pa., and James R. Cricchi, Catonsville, Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.**

**Filed Sept. 22, 1972, Ser. No. 291,469**
**Int. Cl. G08c** *19/28*
**U.S. Cl. 340—151** **10 Claims**



A solid state remote meter reading system includes modular metering chip circuits for counting meter initiated pulses and automatically transmitting encoded meter data pulses. Each metering circuit module includes readout control and data accumulation portions. A binary non-volatile counter in the accumulator portion stores the meter data during power outages. The read-out control portion encodes a data word format for asynchronous data out transmission. Outputs from the read-out control portions of each module are interconnected in a series cascaded relationship to form a common system output for connection to a transmission line. This permits universal use of the metering circuit modules in systems having any required number of meters at a remote location.

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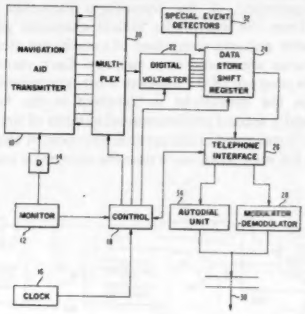
### 3,820,074
### REMOTE OPERATING CONDITION DATA ACQUISITION SYSTEM

**Donald J. Toman, Pleasantville, N.Y., assignor to Tull Aviation Corporation, Armonk, N.Y.**

**Continuation-in-part of Ser. No. 205,081, Dec. 6, 1971, abandoned, and a continuation-in-part of Ser. No. 217,615, Jan. 12, 1972, abandoned. This application Mar. 20, 1972, Ser. No. 236,108**
**Int. Cl. H04q** *9/00*
**U.S. Cl. 340—151** **18 Claims**

Data readings indicative of a plurality of different operating conditions of a radio navigation aid transmitter are automatically taken and means are provided for converting the data readings to a form which can be transmitted over a non-dedicated voice band-width communication link. An interface




means is coupled to the converting means and operable to establish a connection with a communication link for transmission of the data readings.

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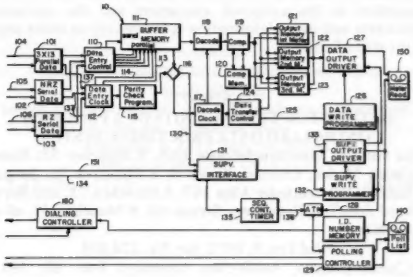
### 3,820,075
### DATA RECEIVER

**Theran L. Ebner, Houston, Tex., assignor to Houston Natural Gas Corporation, Houston, Tex.**

**Filed Jan. 31, 1973, Ser. No. 328,468**
**Int. Cl. G06f** *9/18*
**U.S. Cl. 340—172.5** **11 Claims**




A data receiver for polling, receiving and processing data from a plurality of measuring transducers through a communication system. The receiver being capable of receiving data in a plurality of different signaling modes, processing the received data, and storing the processed data. Means for synchronizing the various signal modes and parity checking the accuracy and validity of the received data. Processing circuitry for handling both serially oriented data and parallel data. An electrically interlocked data programmer and data receiving device, the first of which controls the polling of the transducers and properly identifies the data received in the receiving device.

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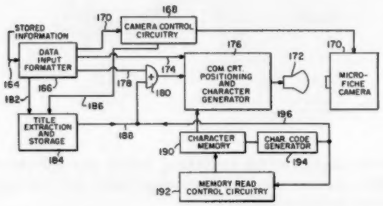
### 3,820,076
### TITLE AND INDEX GENERATOR FOR A MICROFICHE

**William O. Butts, Willingboro, N.J., assignor to Micromation Systems Inc., Landover, Md.**

**Filed Oct. 11, 1972, Ser. No. 296,738**
**Int. Cl. G03b** *23/08*; **G06f** *3/14*
**U.S. Cl. 340—172.5** **13 Claims**

A title and index generator for a microfiche system which does not require the use of software. An eye readable title is

created on the microfiche by extracting a predetermined number of characters from the data to be stored on the microfiche. These characters are used to read out character patterns comprised of the constituent elements of each character from the microfiche system character generator. The character patterns comprised of constituent elements of each character are stored in a memory. Each element of a character is read out of the memory a predetermined number of times as the microfiche is traversed in the horizontal direction and a second predetermined number of times as the microfiche is traversed in the vertical direction. A character is formed on the microfiche each time the element is read out of




memory. The index generator includes means for backstepping an information storage device to its starting position at the beginning of the generation of the microfiche. Once the input data device is returned to its starting position, the input device is again run in the forward direction and means is provided for extracting a predetermined number of characters from the data input at positions corresponding to preselected portions within each page of data on the microfiche. Means is provided for adding standard index information to the extracted characters and the extracted characters and index information is formed on an index page of the microfiche.

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**3,820,077**

## METHOD FOR TESTING UNITS OF A PROGRAM CONTROLLED DATA PROCESSING SYSTEM

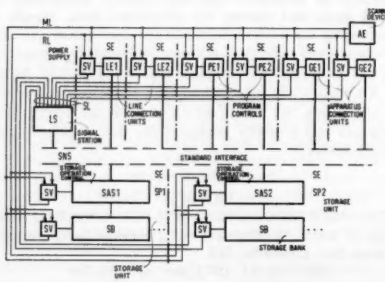
**Fritz Giebler, Sauerbruchstrasse 10/9, 8 Munchen 55; Hans-Ulrich Moder, Littmannstrasse 3, 8 Munchen 71; Jurgen Rabold, Forstenrieder Allee 167, 8 Munchen 71, and Bernhard Schaffer, Kemptener Strasse 63, 8 Munchen 49, all of Germany**

**Filed Feb. 9, 1972, Ser. No. 224,895**

**Claims priority, application Germany, Feb. 10, 1971, 2106163**

**Int. Cl. G06f** *11/02*

**U.S. Cl. 340—172.5** **5 Claims**




A method for testing system units or modules in a modularly constructed data processing system wherein the testing is performed by changing the supply voltage to the system unit under test. After requesting and receiving assignment of a storage cycle in the system's central memory, a program control generates and transmits a command signal. The command signal is evaluated, and a signal datum responsive thereto is formed and transmitted to a power supply connected to the system unit being tested. Depending on the information contained in the latter transmitted signal, the operating voltage of the system unit can be adjusted to approach the limits prescribed for the particular system unit. The operability of the system unit is determined from its response to operating voltages near the outer limits of its range.

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**3,820,078**

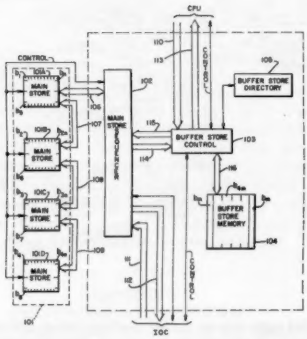
## MULTI-LEVEL STORAGE SYSTEM HAVING A BUFFER STORE WITH VARIABLE MAPPING MODES

**John L. Curley, Sudbury; Thomas J. Donahue, Huson, both of Mass.; Wallace A. Martland, Nashua, N.H., and Benjamin S. Franklin, Boston, Mass., assignors to Honeywell Information Systems, Inc., Waltham, Mass.**

**Filed Oct. 5, 1972, Ser. No. 295,301**

**Int. Cl. G06f** *13/06*

**U.S. Cl. 340—172.5** **40 Claims**




A multi-level storage system providing multiple levels of storage comprising a high-speed low capacity storage device (buffer store) coupled serially to successive levels of lower speed, higher capacity storage devices including means for varying key physical buffer store parameters such as mapping, replacement algorithm, and buffer store size. The buffer store is capable of being accessed in a plurality of modes, each mode being under the dynamic control of a program being executed. An additional mode under control of the software or a switch in the maintenance panel is also provided for bypassing the buffer memory.

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**3,820,079**

## BUS ORIENTED, MODULAR, MULTIPROCESSING COMPUTER

**Arndt B. Bergh, Los Altos Hills; Bert E. Forbes, Palo Alto; James O. Hamilton, III, Sunnyvale, and Joseph C. Mixsell, Jr., Palo Alto, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.**

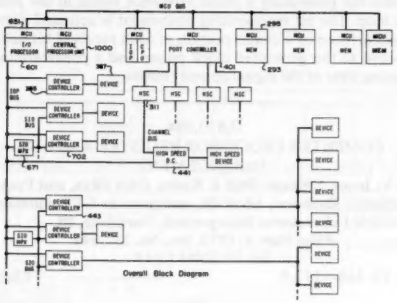
**Continuation of Ser. No. 194,764, Nov. 1, 1971, abandoned. This application Nov. 20, 1972, Ser. No. 316,429**

**Int. Cl. G06f** *15/16*

**U.S. Cl. 340—172.5** **19 Claims**

A multiprocessing computer is structured in modular form around a common control and data bus. Control functions for the various modules are distributed among the modules to facilitate system flexibility. Modules separate from the central

processor handle input/output operations to free the central processor for data manipulation. The central processor includes circuitry for instruction and data pipelining, single, double and triple shifts, preadding and memory mapping and interleaving. The central processor also includes a read only memory look-up table for microprogramming instructions.

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**3,820,080**

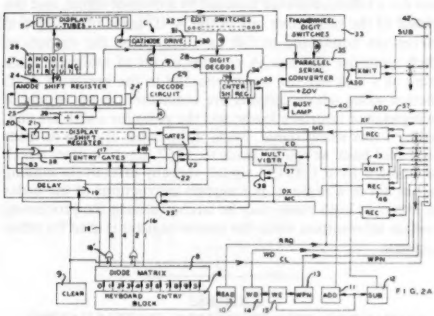
## DISPLAY SYSTEMS FOR ELECTRONIC DATA PROCESSING EQUIPMENT

**Harold B. Abrams, Olivette; Benjamin O. Haynes, Creve Coeur, and Glynn P. Williams, St. Charles, all of Mo., assignors to Myler Digital Sciences, Inc., Maryland Heights, Mo.**

**Division of Ser. No. 141,741, May 10, 1971, Pat. No. 3,735,366, which is a continuation-in-part of Ser. No. 876, Jan. 6, 1970, abandoned. This application Jan. 29, 1973, Ser. No. 327,780**

**Int. Cl. G06f *3/14***

**U.S. Cl. 340—172.5** **19 Claims**



A display system for electronic data storage and retrieval equipment which permits the consecutive and intermittent display of information through a plurality of radiation active elements, such as cold cathode display tubes. The display system includes a recirculating main shift register which may form part of the data storage and retrieval equipment and which main shift register receives data bits representing characters to be displayed. A recirculating anode shift register is connected to the main shift register through a pulse divider and also receiver bits representing certain of the characters to be displayed. An anode driving circuit comprised of a plurality of anode drivers is operated in conjunction with the anode shift register and a plurality of cathode drivers are operated by a decoder connected to the main shift register. In this way a selected anode driver is energizable together with a cathode driver which will energize a selected one of said display tubes.

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**3,820,081**

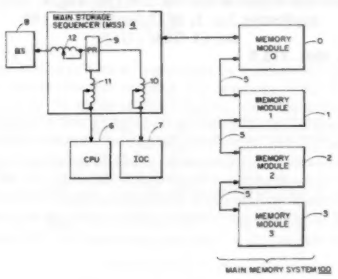
## OVERRIDE HARDWARE FOR MAIN STORE SEQUENCER

**Thomas J. Donahue, Hudson, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.**

**Filed Oct. 5, 1972, Ser. No. 295,418**

**Int. Cl. G06f *7/00*; H03k *19/00***

**U.S. Cl. 340—172.5** **12 Claims**




An override assurance electrical network and override circuitry for overriding request signals issued to a computer for control of access to a main memory store. First and second dynamic storage electrical networks receive and store electric request signals. The request signals are delayed in said first and second electric networks by predetermined amounts, and an override signal is generated by means responsive to the delayed request signals.

3,820,082

## DATA STORAGE MEANS FOR ELECTRICAL CONTROL SYSTEMS PARTICULARLY FOR KNITTING MACHINES

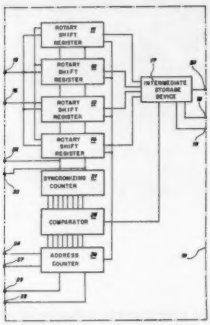
Gunter Bauknecht, Eningen; Wilhelm Hadam, and Jurgen Ploppa, both of Reutlingen, all of Germany, assignors to H. Stoll Company, Reutlingen, Postfach, Germany

Filed Dec. 4, 1972, Ser. No. 311,530

Claims priority, application Germany, Dec. 3, 1971, 2159992

Int. Cl. G06f *13/00*

U.S. Cl. 340—172.5 7 Claims




A data storage means for an electrical control system such as is used with a textile, e.g. knitting, machine which produces webs of material, is provided which comprises a plurality of modules each forming a part memory, the modules, each of which includes a memory in the form of a rotary shift register, being selectively combinable to form a whole or complete memory of a desired capacity. The individual modules are detachably received in, e.g., inserted in, a carrier which includes data input(s), a data output and control input(s). The modules further include an intermediate storage device (memory) connected to the rotary shift register through a read-out device.

3,820,083

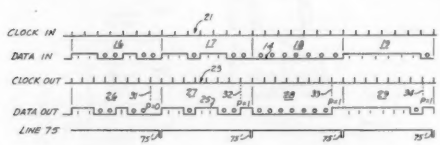
## CODED DATA ENHANCER, SYNCHRONIZER, AND PARITY REMOVER SYSTEMS

John L. Way, La Canada, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Continuation-in-part of Ser. No. 278,138, Aug. 4, 1972. This application Jan. 5, 1973, Ser. No. 321,197

Int. Cl. G06f *11/10*

U.S. Cl. 340—172.5 37 Claims




A first stream of binary words is accompanied by a first series of clock pulses, each word having n bits and being accompanied by n clock pulses. To enhance binary transitions in this stream of binary words, a second series of clock pulses having (n+1) clock pulses for each n clock pulses of the first series is provided. A second stream of binary words in which each binary word of the first stream is accommodated within n clock pulses of the (n+1) clock pulses of the second series is also provided. Binary words in the second stream are then provided with parity bits during clock pulses outside the n clock pulses within which each binary word is accommodated in the second stream.

Apparatus for synchronizing bits of binary data have selectively actuable equipment for regenerating received data bits. A phase lock loop generates clock pulses synchronized with the regenerated bits. The phase lock loop includes a digital counter for generating a phase reference signal in the phase lock loop. The bit regenerating equipment is actuated during the occurrence of a center portion of each received bit and in response to the generated clock pulses and a predetermined counting state of the digital counter means.

3,820,084

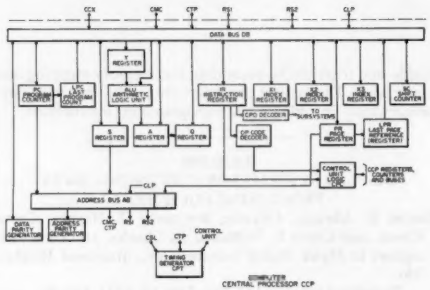
## COMPUTER PROCESSOR REGISTER AND BUS ARRANGEMENT

Leo V. Jones, Chicago; Paul J. Keehn, Glen Ellyn, and Paul A. Zelinski, Elmhurst, all of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Mar. 1, 1973, Ser. No. 337,041

Int. Cl. G06f *15/18*

U.S. Cl. 340—172.5 7 Claims




The computer processor comprises a plurality of registers and an arithmetic logic unit along with interfaces with other units of a data processing system connected as sources and sinks to one data bus and one address bus. Each source for a bus has leads from the output of a register or a set of interface leads connected to inputs of AND function gates with the gates for a selected source enabled by a control signal, and the outputs of the respective bits of the AND gates of the several sources are connected to OR function gates, the outputs of which comprise the bus. A register or set of interface leads acting as a sink has the bus connected to the inputs of AND function gates whose outputs are connected to the inputs of the register or interface leads; and the gates for a sink are enabled by a sink select signal. Each of the buses also has its leads connected back as source leads to AND function gates which are enabled by a LATCH signal, thereby effectively making the bus act as a register. For certain instructions of the order set, either or both buses may be latched during the processing to retain information while the source register is used for other purposes.

3,820,085

## COMMUNICATION SWITCHING SYSTEM HAVING SEPARATE REGISTER SUBSYSTEM AND STORED PROGRAM PROCESSOR EACH HAVING ITS OWN MEMORY, AND DATA TRANSFER BY PROCESSOR ACCESS TO THE REGISTER MEMORY

Paul A. Zelinski, Elmhurst, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

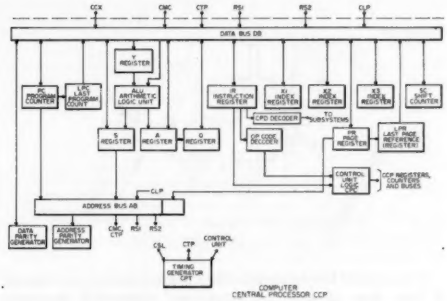
Filed Apr. 6, 1973, Ser. No. 348,815

Int. Cl. G05b *15/00*; H04m *3/00*

U.S. Cl. 340—172.5 3 Claims

The order set of the stored program processor includes two special instructions to provide direct access to the register

subsystem memory instead of the main processor memory, one to read a word from the register memory and one to write data in a word thereof, in each case at the effective address in the register memory designated by the instruction. There may be two separate register subsystems, and one bit of the address selects the subsystem. Both the processor and each of the register subsystems is duplicated, and either copy of the processor may communicate with either copy of the selected register subsystem. There are also command pulse directives which may be sent from the processor to a selected register subsystem, and sense line and interrupt signal lines from each register subsystem to the processor.

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**3,820,086**

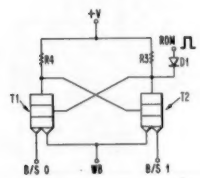
**READ ONLY MEMORY (ROM) SUPERIMPOSED ON READ/WRITE MEMORY (RAM)**

**Irving T. Ho, Poughkeepsie, and Gerald A. Maley, Fishkill, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed May 1, 1972, Ser. No. 249,076**

**Int. Cl. G11c** *11/40, 17/00;* **H03k** *3/286*

**U.S. Cl. 340—173 FF** **21 Claims**




The disclosures describes a transistor storage cell operable both as a random access read/write memory cell or as a read only memory cell. The memory cell structure includes a bistable circuit adapted to be set into one of two stable conditions and an imbalancing means for providing structural asymmetry. The memory cell is operable either as a read/write cell or, by accessing the cell through the imbalancing means, the latent image provided by the structural asymmetry of the cell is read out without affecting the information contained in the cell from the read/write mode of operation.

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**3,820,087**

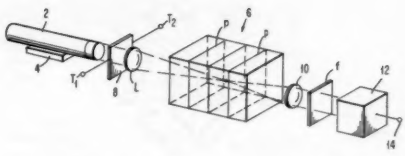
**THREE DIMENSIONAL MEMORY**

**Praveen Chaudhari, Briarcliff Manor, N.Y., and Charles B. Zarowin, Rowayton, Conn., assignors to International Business Machines Corporation, Armonk, N.Y.**

**Filed Dec. 29, 1972, Ser. No. 319,405**

**Int. Cl. G11c** *11/42, 13/04*

**U.S. Cl. 340—173 LM** **5 Claims**




A three dimensional memory using materials switchable from an amorphous state to a crystalline state and back again to its amorphous state is realized by focusing a laser beam into different depths of the material. The material, when in its crystalline state, is capable of generating the harmonic of the frequency of the incident light used to interrogate its state, whereas in its amorphous state it is not a generator of harmonics. The detection of this harmonic allows for increased discrimination in the data reading process.

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**3,820,088**

**FERROELECTRIC MEMORIES, AND METHOD OF ACTIVATING THE SAME**

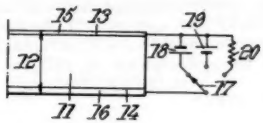
**Armand Hadni, Nancy, and Robert Thomas, Saint-Die, both of France, assignors to Agence Nationale De Valorisation De La Recherche (Anvar), Courbevoie, France**

**Filed July 20, 1972, Ser. No. 273,531**

**Claims priority, application France, July 23, 1971, 71.27044**

**Int. Cl. G11c** *11/22, 11/42*

**U.S. Cl. 340—173.2** **9 Claims**




The invention relates to high-capacity memory devices permitting non-destructive reading. The memory (FIG. 4 ) comprises a plate **11** made of ferroelectric material with a very thin metallized film **15** thereon to absorb the radiation from a laser beam, and a thicker metallized film **16**. The source **18** allows the orientation of all the ferroelectric domains. A second source **19**, in combination with laser scanning, permits writing into the memory device. Reading is effected by scanning with the laser and detecting the direction of current flow through the resistor **20**. For use as memory devices in computers.

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**3,820,089**

**MAGNETIC BUBBLE DOMAIN DETECTION**

**Ugis Guntis Lama, Ottawa, Ontario, Canada, assignor to Bell Canada-Northern Electric Company Limited, Ottawa, Ontario, Canada**

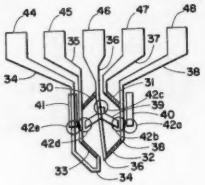
**Filed Nov. 16, 1971, Ser. No. 199,199**

**Int. Cl. G11c** *11/14*

**U.S. Cl. 340—174 EB** **4 Claims**

A magnetic bubble domain detector comprising two pairs of magnetoresistive elements connected to form a resistance

bridge circuit. The pairs of elements are so arranged, electrically and geometrically that a magnetic bubble domain, in the detecting position, affects two elements simultaneously. The two elements are a pair and the elements are connected in electrical opposition but are positioned geometrically adjacent. This doubles the output from the bridge circuit when a bubble is at the detecting position. The arrangement of the




elements of a pair also provides for the reduction of extraneous signals from domains in other positions, and for a reduction in the effect of the rotating field for propagating the domains.

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**3,820,090**

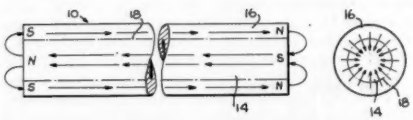
## BISTABLE MAGNETIC DEVICE

**John Richard Wiegand, Valley Stream, Long Island, N.Y., assignor to Milton Vlinsky, Plainfield, N.J. and John R. Wiegund, Valley Stream, N.Y., part interest to each**

**Continuation-in-part of Ser. No. 5,631, Jan. 26, 1970, Pat. No. 3,602,906, and a continuation-in-part of Ser. No. 5,632, Jan. 26, 1970, abandoned, and a continuation-in-part of Ser. No. 86,169, Nov. 2, 1970, abandoned, and a continuation-in-part of Ser. No. 137,567, April 26, 1971, abandoned, and a continuation-in-part of Ser. No. 173,070, Aug. 19, 1971, abandoned. This application Apr. 25, 1972, Ser. No. 247,356**

**Int. Cl. G11c** *11/06*

**U.S. Cl. 340—174 ZB** **32 Claims**




A bistable ferromagnetic wire of generally uniform composition having a central relatively "soft" core portion and an outer relatively "hard" magnetized shell portion with relatively low and high coercivity respectively and whereby (a) the magnetized shell portion is operable for magnetizing the core portion in a first direction, (b) the magnetization of the core portion is reversible by application of a separate magnetic field and (c) the shell portion is operable to remagnetize the core portion in the first direction upon removal of the separate magnetic field.

**3,820,091**

## MAGNETIC DOMAIN SPLITTER

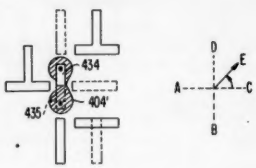
**Haruki Kohara, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Minoto-ku, Tokyo, Japan**

**Division of Ser. No. 194,435, Nov. 1, 1971, Pat. No. 3,743,851. This application Aug. 17, 1972, Ser. No. 281,611**

**Claims priority, application Japan, Nov. 5, 1970, 45-97354**

**Int. Cl. G11c** *11/14, 19/00*

**U.S. Cl. 340—174 TF** **1 Claim**




A pattern of ferromagnetic films is provided on each side of a thin film capable of supporting cylindrical magnetic domains. A rotating magnetic field in the plane of said thin film provides variable patterns of magnetic poles at the ends of the ferromagnetic films to cause splitting of cylindrical magnetic domains.

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**3,820,092**

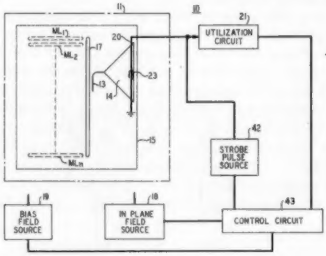
## MAGNETIC DOMAIN DETECTOR ARRANGEMENT

**Andrew Henry Bobeck, Chatham; Frank John Ciak, Roselle Park, and Walter Strauss, Summit, all of N.J., assignors to Bell Telephone Laboratories Incorporated, Berkeley Heights, N.J.**

**Filed Jan. 22, 1973, Ser. No. 325,508**

**Int. Cl. G11c** *11/14*

**U.S. Cl. 340—174 EB** **11 Claims**



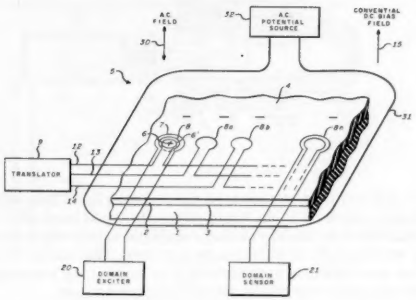

An enhanced output signal is provided by the coupling of a magnetic bubble to a magnetoresistance detector element when the familiar rotating in-plane drive field is set at an amplitude such that the presence of a bubble results in a change in frequency in signal exhibited by the detector element due to the in-plane field. The largest signals yet achieved resulted from an integrated expansion detector, guard rail arrangement with a meandering magnetoresistance element when operated in this manner.

3,820,093

## METHOD AND MEANS FOR REDUCING DOMAIN PINNING IN MAGNETIC WALL DOMAIN DEVICES

Alan B. Smith, Lincoln, and Warren W. Goller, Maynard, both of Mass., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Feb. 20, 1973, Ser. No. 333,605
Int. Cl. G11c 11/14, 19/00
U.S. Cl. 340—174 TF 10 Claims



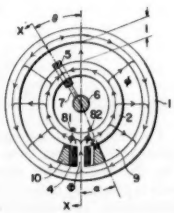

An alternating magnetic field applied preferably perpendicularly to the magnetic layer of a magnetic wall domain device reduces the domain pinning effect of defects in the magnetic layer thereby apparently reducing the coercivity of the magnetic material.

3,820,094

## DISPLACEMENT-ELECTRIC SIGNAL CONVERTER

Mineju Mouri, and Katsuhiko Aoki, both of Kasasaki, Japan, assignors to Fuji Electric Company Limited, Kanagawa, Japan

Filed Apr. 11, 1973, Ser. No. 350,254
Claims priority, application Japan, Apr. 11, 1972, 47-36333; Aug. 3, 1972, 47-78218
Int. Cl. G08c 19/08
U.S. Cl. 340—199 6 Claims



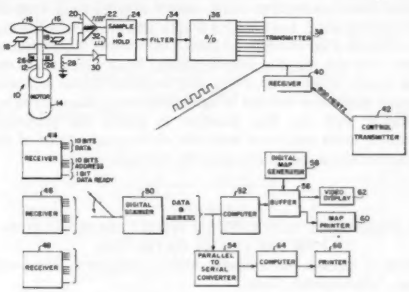
A displacement-electric signal converter comprises two annular magnetic bodies disposed concentrically, a magnetizing coil placed in an air gap formed between the two annular magnetic bodies, a short-circuiting ring freely rotatably provided on one of the two annular magnetic bodies, and at least one detecting coil provided on one of the two annular magnetic bodies for detecting magnetic fluxes flowing the interior of the annular magnetic body, an a.c. voltage being supplied to the magnetizing coil, the short-circuiting ring being rotated corresponding to a displacement to be measured, whereby an electric signal corresponding to the displacement to be measured can be obtained from the detecting coil.

3,820,095

## ELECTRIC FIELD MEASURING AND DISPLAY SYSTEM

Ronald J. Wojtasinski, Cocoa Beach, and Donald D. Lovall, Rockledge, both of Fla., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Sept. 13, 1972, Ser. No. 288,847
Int. Cl. G08c 19/10
U.S. Cl. 340—200 4 Claims



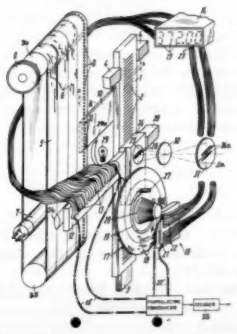

An apparatus for monitoring the electric fields of cloud formations within a particular area which utilizes capacitor plates that are alternately shielded from the clouds for generating an alternating signal corresponding to the intensity of the electric field of the clouds. A synchronizing signal is produced for controlling sampling of the alternating signal. Such samplings are fed through a filter and converted by an analogue to digital converter into digital form and subsequently fed to a transmitter for transmission to the control station for recording.

3,820,096

## MECHANO-OPTICAL DIGITAL POSITION-INDICATING SYSTEM WITH VERNIER READING

Paul Himmelsbach, and Werner Faller, both of Bad Kreuznach, Germany, assignors to Jos. Schneider & Co., Optische Werke Krueznach, Bad Kreuzmach, Germany

Filed Apr. 26, 1973, Ser. No. 354,854
Claims priority, application Germany, Apr. 28, 1972, 2220934
Int. Cl. G08c 19/36, 19/30, 23/00
U.S. Cl. 340—204 14 Claims



A code carrier with several parallel tracks moves past a first reading head which feeds a digital indicator, through several bundles of light-conductive filaments assigned to respective

digital positions, in accordance with transparent or reflective code markings on associated tracks of the carrier which is coupled with a measuring bar for joint movement therewith. The code markings on the carrier tracks define a multiplicity of unit steps giving a coarse reading of the measured value. The measuring bar is provided with light-transmissive graduations whose spacing corresponds to the unit steps and which are optically projected onto a receiving surface together with a reference mark from a slider coupled, through a step-down transmission, with a rotatable control disk having several concentric code tracks. The slider, which may be rigid with the first reading head, has a stroke length just short of a unit step so as to give a vernier measurement, in terms of supplemental digits, with the aid of a second reading head which scans the code tracks of the control disk and feeds the digital indicator through additional bundles of light-conductive filaments in accordance with the disk position in which the projected reference mark coincides with one of the graduations of the measuring bar as projected upon the receiving surface.

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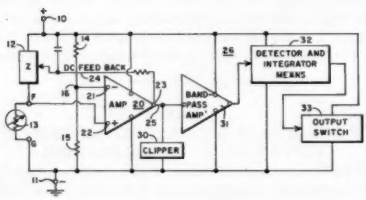
**3,820,097**

## FLAME DETECTION SYSTEM WITH COMPENSATION FOR THE FLAME DETECTOR

**Martin E. Larson, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.**

**Filed Apr. 16, 1973, Ser. No. 351,740**
**Int. Cl. G08b** *17/12*
**U.S. Cl. 340—228.2** **15 Claims**




A flame detection system utilizes a flame responsive impedance, such as a lead sulphide photocell, and responds to the change in infrared radiation and the flame flicker frequency of the sensed flame. The flame responsive impedance is connected through a variable impedance means to a source of direct current voltage. The voltage between the flame responsive impedance and the variable impedance means is compared by an amplifier to a voltage divider network so that a feedback voltage can be generated by the amplifier to control the variable impedance means. The variable impedance means is controlled by the feedback so as to keep the direct current voltage across the flame responsive impedance constant to compensate for variations in flame background radiation, and cell to cell variation. The system then uses a band-pass amplifier and detector-integrator system to control an output switch.

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**3,820,098**

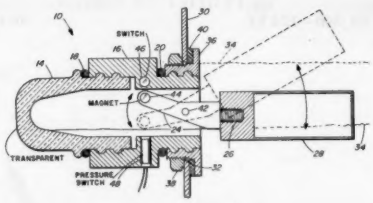
## ELECTRICAL AND VISUAL FLUID LEVEL SENSOR

**Thomas R. Demyon, 6201 Loch Raven Blvd., Baltimore, Md. 21212, and Nicholas J. LaCosta, Box 218, Rt. No. 3, Phoenix, Md. 21131**

**Filed Apr. 18, 1972, Ser. No. 245,226**
**Int. Cl. G08b** *19/00*
**U.S. Cl. 340—244 B** **4 Claims**

An improved method and liquid level sensor device is provided for monitoring the level of fluid in a container, by either or both, visual or electrical means.

The sensor device is mounted onto a container and projects into the same. A small glass cap located on the outside section of the sensor device remains full of the liquid as long as the desired liquid level inside of the container is maintained. When the level of the liquid in the container falls, the cap will empty, thus giving a visual check. The section of the sensor




device that is on the inside of the container has a float which follows the level of the liquid. When the liquid level falls, the float also falls, thereby closing a magnetic switch which causes a warning light or buzzer to be activated. This sensor device can also contain a pressure switch to monitor the pressure in the container and give an alarm by electrical means.

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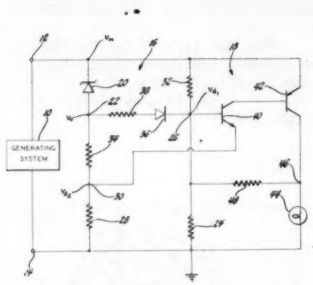
**3,820,099**

## VOLTAGE DETECTOR

**Kenneth S. Vogt, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.**

**Filed Apr. 17, 1972, Ser. No. 244,571**
**Int. Cl. G08b** *23/00*
**U.S. Cl. 340—248 A** **5 Claims**




The magnitude of a monitored voltage is detected with respect to a lower level and an upper level. The lower level is primarily defined by the breakdown potential of a Zener diode. The upper level is primarily defined by a predetermined potential difference between two signal voltages defined in different proportions to the monitored voltage by two different voltage divider networks connected to the Zener diode.

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**3,820,100**

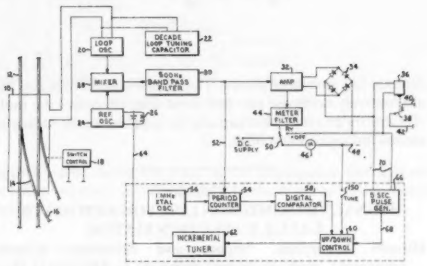
## PRESENCE DETECTOR HAVING AUTOMATIC DIGITAL TUNING

**Forrest H. Ballinger, Grain Valley; Robert E. Heggestad, Blue Springs, and Leland W. Olmsted, Gladstone, all of Mo., assignors to Harmon Industries, Inc., Grain Valley, Mo.**

**Filed Sept. 27, 1972, Ser. No. 292,737**
**Int. Cl. G08b** *13/26*
**U.S. Cl. 340—258 C** **16 Claims**

Apparatus for determining whether a movable body, such as a railway car traveling along a track, is present in a preselected

zone of interest along its path of travel. In railway applications for detecting the presence of a car over a switch, for example, an inductive loop is laid along the track and forms a part of the tank circuit of an oscillator. The resulting signal is mixed with the output signal from a variable frequency reference oscillator to provide an intermediate frequency signal that is subject to frequency variations as the loop inductance changes. To correct for such variations, an automatic digital tuning arrangement is provided for the reference oscillator to maintain the IF signal at a normal frequency within a predetermined range within which the intermediate frequency is permitted to




vary in response to changing environmental conditions. The response of the digital tuner is sufficiently rapid to correct gradual variations in frequency characteristic of changing environmental conditions, but is purposely limited in order to be incapable of making the correction in the event of a sudden frequency variation caused by the presence of a car. When this occurs, the intermediate frequency shifts outside of the normal range and the apparatus assumes an output condition indicative of the presence of the car. Once the car is detected, the automatic tuner is disabled to positively preclude frequency correction until the car is no longer sensed by the loop.

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**3,820,101**

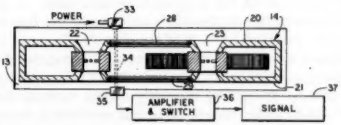
**REMAINING TAPE SENSING APPARATUS**

**Fred C. Bolick, Jr., Atlanta, Ga., assignor to Lanier Electronic Laboratory, Inc., Atlanta, Ga.**

**Filed June 15, 1972, Ser. No. 263,314**

**Int. Cl. G08b** *21/00*

**U.S. Cl. 340—259** **3 Claims**




Apparatus for use with a web feed apparatus such as a tape recorder, in which a supply of the web material wound on a spool is withdrawn from the spool for use, to provide an indication when only a predetermined amount of web remains on the spool. The present apparatus is responsive to the amount of tape remaining on the spool, and so an indication corresponding to the amount of remaining tape is made irrespective of the amount of tape initially on the spool. In one disclosed embodiment of the invention, a source of suitable radiation, such as illumination, and a radiation sensitive device are positioned on opposite sides of the tape spool at a predetermined distance from the axis of the spool, so that the radiation path remains interrupted by the tape on the spool until only a predetermined amount of tape remains on the spool. No mechanical or electrical interconnection with the tape transport mechanism is required. In another disclosed embodiment, the tape supply spool is connected to provide a signal having a parameter which is proportional to the speed at which the tape supply spool is rotated. A signal is provided in response to a parameter value corresponding to the supply spool rotational speed caused by a predetermined amount of remaining tape.

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**3,820,102**

**PREMISES ENTRY AND EXIT SIGNALING SYSTEM**

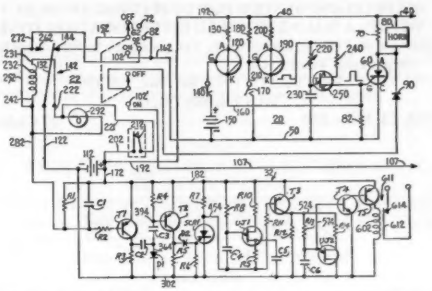
**Howard C. Schubert, Leonia, N.J., assignor to Aerolite Electronics Corp., Union City, N.J.**

**Continuation-in-part of Ser. No. 879,258, Nov. 24, 1969, abandoned.**

**Filed July 24, 1972, Ser. No. 274,806**

**Int. Cl. G08b** *13/08*

**U.S. Cl. 340—276** **23 Claims**




The system includes a signaling circuit adapted to provide a signal when the protected premises have been entered or left by authorized personnel and a gate means controlling the operation of the signaling circuit. The gate is operated by a second circuit which includes a warning light, a master multiposition switch located inside the premises, a normally-open switch, and a normally-closed outside switch located outside the premises. The connections are such that the master switch is used to operate the system when authorized personnel enter the premises, but the combined action of the master switch and outside switch are required when authorized personnel leave the premises. Tampering with the outside switch is of no effect once the system has been set.

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**3,820,103**

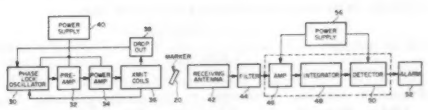
**SYSTEM FOR DETECTING AN OBJECT WITHIN A MAGNETIC FIELD**

**Edward R. Fearon, Richardson, Tex., assignor to Stop-Loss Incorporated, Atlanta, Ga.**

**Filed Dec. 15, 1972, Ser. No. 315,319**

**Int. Cl. G08b** *13/24*

**U.S. Cl. 340—280** **11 Claims**




The specification discloses a system for detecting a marker secured to an object when the object is positioned within an interrogation zone having a magentic field periodically varying at a predetermined fundamental frequency. The magnetic field is generated by a coil unit including a plurality of loops of rigid hollow metal pipe which is electrically resonated by capacitors and energized by an electrical signal having a

frequency equal to the resonant frequency of the electrical circuit. Phase-lock loop circuitry is provided to maintain the drive to the pipe loops at a frequency equal to the resonant frequency of the pipes, irregardless of variance in the load imposed in the magnetic field generated by the pipes. The transmitting pipe loops are also driven by electrical signals of less than full wave, such that the generated magentic field has improved distortion characteristics. The marker of the invention generates detectable signals containing harmonics of the fundamental frequency of the alternating magnetic field. Detection circuitry is provided to detect the harmonic signals generated by the marker. The detection circuit is gated in synchronism with the less than full wave driving signal applied to the transmitting coil. A dropout circuit is provided to disconnect the transmitting circuitry in case a heavy load is imposed upon the magnetic field.

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**3,820,104**

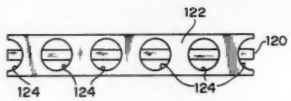
**METHOD AND SYSTEM FOR DETECTING AN OBJECT WITHIN A MAGNETIC FIELD INTERROGATION ZONE**

**Edward R. Fearon, Richardson, Tex., assignor to Stop-Loss Incorporated, Atlanta, Ga.**

**Filed Dec. 15, 1972, Ser. No. 315,320**

**Int. Cl. G08b** *13/26*

**U.S. Cl. 340—280** **27 Claims**




This specification discloses a marker for being secured to an object to enable the detection of the object within an interrogation zone having a magnetic field periodically varying at a predetermined fundamental frequency. The marker includes a first elongated ferromagnetic element for being secured to the object. The first ferromagnetic element has a relatively low coercivity and is operable to generate a detectable signal containing harmonics of the fundamental frequency when placed in the interrogation zone. The marker further includes a second ferromagnetic element disposed adjacent to the first element and having a coercivity greater than the first element. Deactivation structure is provided to selectively magnetize the second ferromagnetic element to impose a plurality of pairs of alternate magnetic poles on the first element in order to deactivate the marker. The deactivated marker does not generate a detectable signal containing the desired harmonics when the object passes through the interrogation zone. In the preferred embodiment of the invention, the second ferromagnetic element is constructed so as to be magnetized by a predetermined magnetic field oriented in any direction to deactivate the marker. Also in the preferred embodiment, deactivation structure is provided which checks to insure that the marker has been deactivated prior to allowing the energization of an auxiliary device such as a cash register or the like.

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**3,820,105**

**ELECTRIC SIGNALING DEVICE FOR ALARM CLOCKS**

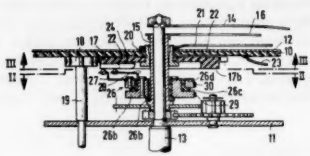
**Friedrich Assmus, Schillerstr 6, Schramberg/Wurtt; Hans Flaig, Hutneck 23, Schramberg-Sulgen/Wurtt; Dieter Dietrich, Brestenberg, Lauterbach/Wurtt, and Leo Hartner, Angst 514, Aichhalden/Wurtt, all of Germany**

**Continuation of Ser. No. 74,314, Sept. 22, 1970, abandoned. This application Mar. 13, 1973, Ser. No. 340,739**

**Int. Cl. G04c** *21/00*

**U.S. Cl. 340—309.4** **5 Claims**

An electrical signaling device for providing intermittent and continuous indicating signals in response to first and second successive signals wherein an unstable multi-vibrator is switched by the first signal to activate an indicator and deactivated by the second signal to connect the indicating means directly to a source of power. The unstable multi-vibrator may alternatively comprise two and three transistors and the multivibrator output may alternatively be supplied to the indicating means through an amplifier.



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**3,820,106**

**SIGNAL TRANSMISSION LINE FOR AUTOMATIC GAUGE INSPECTION SYSTEM**

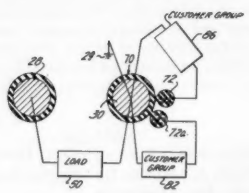
**Hiroshi Yamashita, Minoo, and Michihiro Ishizaka, Amagasaki, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Chuyoda-Ku, Japan**

**Filed May 17, 1971, Ser. No. 144,163**

**Claims priority, application Japan, May 20, 1970, 45-43570; July 9, 1970, 45-60104**

**Int. Cl. H04m** *11/04*

**U.S. Cl. 340—310 A** **5 Claims**




Metering devices such as utility meters include series resonant circuits connected in parallel to a common transmission line through indicating means comprising normally open contacts. Each time the meter integrates one unit of power, its contacts are closed for a predetermined time. A sampling means in a repeater successively delivers to the line different frequencies assigned to each of the circuits. If one of the resonant circuits receives its own frequency during the closure of its contacts, a decrease in line impedance is sensed by the repeater and its associated memory means such as a register counts "ONE". The transmission line includes a neutral conductor of a three-phase three-wire distribution system and a covered signal transmission conductor juxtaposed in an electrically insulated relationship by an insulation.

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**3,820,107**

**SIGN DISPLAY DEVICE**

**Yoshiaki Niizawa, Kawasaki; Reiji Hirano, Yokohama; Matsutoshi Ito, Narashino, and Junichi Ishiata, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed Sept. 13, 1972, Ser. No. 288,738**

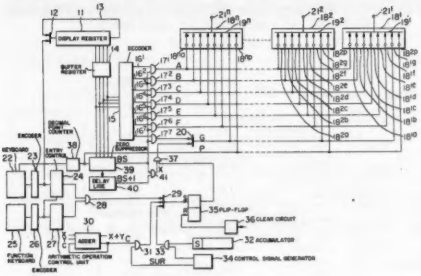
**Claims priority, application Japan, Sept. 20, 1971, 46-85590[U]**

**Int. Cl. G08b** *5/36*

**U.S. Cl. 340—324 R** **11 Claims**

In a desk top electronic calculator, a visual display device is incorporated to display the numerical information, in which a

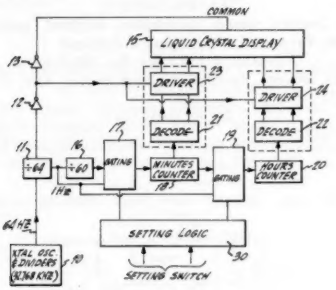
zero a zeros preceding the significant digit or digits to be displayed are suppressed. When a sign such as minus (−) is required to be displayed, such sign is displayed in the digit adjacent to the most significant digit of the number or significant digits to be displayed.



### 3,820,108
### DECODER AND DRIVER CIRCUITS PARTICULARLY ADAPTED FOR USE WITH LIQUID CRYSTAL DISPLAYS

**Nunzio A. Luce, Trenton, N.J., assignor to Optel Corporation, Middlesex, N.J.**

**Filed Mar. 10, 1972, Ser. No. 233,669**
**Int. Cl. G09f** *9/30*
**U.S. Cl. 340—336** **10 Claims**



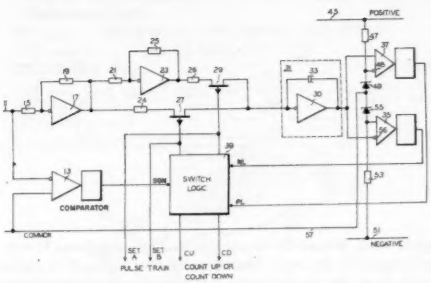

A decoder-driver network for energizing a liquid crystal display used in a timepiece to cause the same to provide any one of a plurality of presentations according to any one of a number of coded formats. The decoder-driver circuit uses bidirectional devices arranged in series paths to minimize components and increase reliability.

### 3,820,109
### CYCLOCONVERTER INTERFACE APPARATUS

**Charles E. Konrad, and Burnette P. Chausse, both of Roanoke, Va., assignors to General Electric Company, Salem, Va.**

**Continuation of Ser. No. 556, Jan. 5, 1970, abandoned. This application Jan. 19, 1972, Ser. No. 218,967**
**Int. Cl. H03k** *13/20;* **G06g** *7/18*
**U.S. Cl. 340—347 NT** **8 Claims**

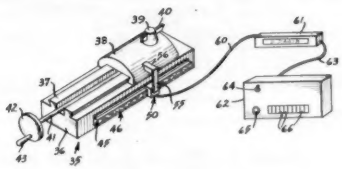
A conversion circuit having polarity sensing wherein an input signal is converted into two signals each of which is the inverse of the other. A pair of switches, arranged to conduct these signals selectively, are connected to an integrator which accumulates the voltage of these signals within predetermined limits set by a pair of comparators. Control logic between the comparators and the switches, together with a third comparator producing a binary signal in response to polarity changes of the input signal, cause alternate conduction of the signals and produce a square wave pulse train having a pulse rate proportional to the absolute magnitude of the input signal.




### 3,820,110
### EDDY CURRENT TYPE DIGITAL ENCODER AND POSITION REFERENCE

**Charles T. Henrich, 7 High St., Huntington, N.Y. 11743, and John M. Pierce, 3332 Middlefield Rd., Palo Alto, Calif. 94306**

**Filed Mar. 22, 1973, Ser. No. 343,770**
**Int. Cl. G08c** *9/08*
**U.S. Cl. 340—347 P** **11 Claims**



A position indicating apparatus in the form of an absolute digital encoder with fixed and movable parts. One of the parts has coded position reference information thereon and the other part has a sensor including a plurality of variable reluctance transducer elements for sensing the position reference information and indicating the position of the sensor relative to a known, fixed position on the reference. The reference may be linear, circular, or cylindrical to conform to the need for measuring linear and/or angular displacement.

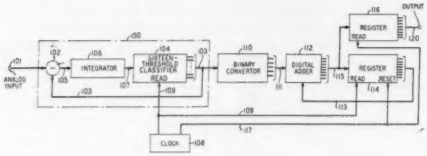
### 3,820,111
### ANALOG-TO-DIGITAL CONVERTER

**James Charles Candy, Convent Station, N.J., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.**

**Filed Nov. 13, 1972, Ser. No. 305,977**
**Int. Cl. H03k** *13/00*
**U.S. Cl. 340—347 AD** **1 Claim**

An analog signal to be converted is coupled to one input of a subtraction circuit, a second input of which is connected to receive the analog equivalent of a previously established digital word. The output of the subtraction circuit is directly connected to an integrator, the potential in which is connected to the input of a threshold classifier circuit. The classifier circuit generates an output in response to each clock pulse from a clock generator, and this output is coupled both to the

above-mentioned second input of the subtraction circuit and to the input of a binary converter. The digital words formed by the binary converter are coupled to the input of a digital averaging circuit, the output of which provides the output



digital word. Where the threshold classifier establishes M voltage ranges for the input analog signal, averaging of N digital words from the binary converter provides an output digital word whose accuracy is equivalent to N times M quantization levels.

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**3,820,112**

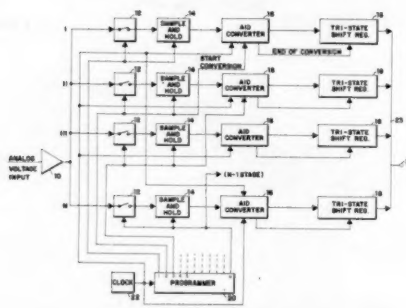
## HIGH SPEED ANALOG-TO-DIGITAL CONVERSION SYSTEM

**Albert Roth, 248 Rockhurst Dr., San Diego, Calif. 92120**

**Filed Oct. 1, 1973, Ser. No. 402,241**

**Int. Cl. H03k** *13/02*

**U.S. Cl. 340—347 AD** **5 Claims**



A high speed analog-to-digital conversion system is provided by utilizing a number of standard analog-to-digital converters in a "pipeline" mode of operation, sampling the analog data at high speeds, multiplexing each sample successively into each channel of the analog-to-digital converter array, performing the serial analog-to-digital conversion in each channel, feeding the serial data from each channel into its respective tri-state shift register, and finally reading the contents of each shift register in parallel to a common bus.

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**3,820,113**

## TARGET TAKE-OVER CIRCUIT

**Bernard Gellekink, Hangelo, and Theodorus Albertus Clemens, Almelo, both of Netherlands, assignors to N. V. Hollands Signaalapparaten, Hengelo (O), Netherlands**

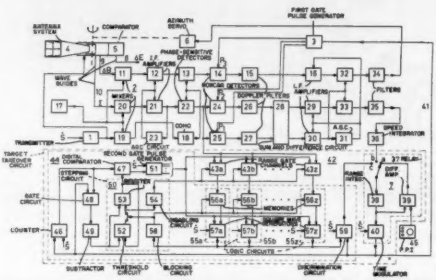
**Filed Dec. 14, 1972, Ser. No. 314,911**

**Claims priority, application Netherlands, Dec. 15, 1971, 7117162**

**Int. Cl. G01s** *9/16*

**U.S. Cl. 343—7.3** **10 Claims**

A target take-over circuit, being aligned with estimated target positions, causes a wide range gate to follow up a series of estimated range values. Each of these values render a counter position, which is compared with a previous reduced counter position to obtain a timing interval. During this interval the access to each of the range gate channels is enabled and disabled



successively, while the range gate channel, supplied with a video signal, delivers a square-wave reference voltage, of which the duration corresponds with the target range, valid at the moment of detection. The range servo follows up said voltage, whereupon a tracking system is actuated.

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**3,820,114**

## TESTING DEVICE

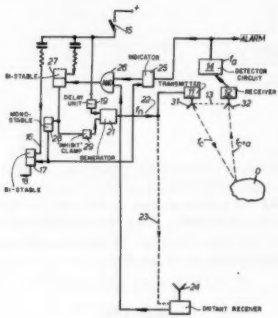
**Robert Leonard Green, Teddington, England, assignor to Granley Products Limited, London, England**

**Filed Oct. 4, 1972, Ser. No. 294,978**

**Claims priority, application Great Britain, Oct. 5, 1971, 46310/71**

**Int. Cl. G01s** *9/42*

**U.S. Cl. 343—17.7** **6 Claims**



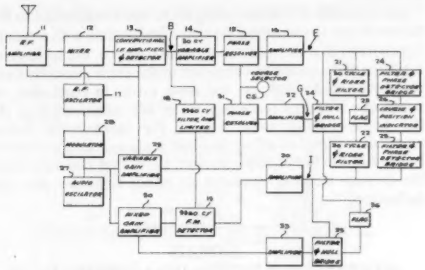
This invention is a testing device for a transmitting/receiving system for detecting movement due, for example, to an intruder or a fire, and is arranged to be automatically operated when the main system is switched on to perform a test that the transmitter and receiver are operating correctly by applying a test signal to be transmitted and by detecting whether the test signal is received at a distant location and also by testing that the test signal applied directly to the receiver gives an alarm signal.

3,820,115

## NAVIGATIONAL RECEIVER FAILURE WARNING SYSTEM

Neil Stone, 940 W. Kingston Dr., N.E., Atlanta, Ga. 30342

Filed Sept. 24, 1971, Ser. No. 183,419
Int. Cl. G01s 1/08
U.S. Cl. 343—107 12 Claims



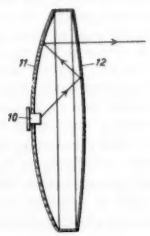
A radio receiver for navigational or guidance of aircraft, including a channel of conventional processing circuits for processing the received radio signals to activate a course indicator, circuitry for superimposing rider signals on the received radio signals near the input end of the channel, apparatus for comparing the rider signals after processing through the channel with their original form, and an alarm indicator for indicating selected differences between the compared signals.

3,820,116

## DOUBLE REFLECTOR ANTENNA WITH POLARIZATION ROTATING MAIN REFLECTOR

Eric Ake Ragnar Carlsson, Goteborg; Olof Gustav Robert Dahlsjo, Molndal; Goran Roland Karlsson, Nygard, and Kent Morgan Pettersson, Goteborg, all of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Apr. 4, 1973, Ser. No. 347,843
Claims priority, application Sweden, Apr. 24, 1972, 5357/72
Int. Cl. H01q 19/00
U.S. Cl. 343—756 8 Claims



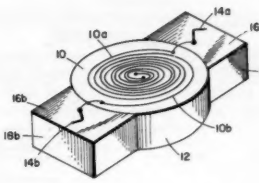

A double reflector antenna system has a polarization rotating main reflector which is symmetrical, a polarization dependent subreflector which is symmetrical, and a feeder arranged with its aperture between the main reflector and the subreflector to deliver energy to or receive energy from the subreflector, the aperture being in a plane perpendicular to the symmetry axis of the two reflectors and having an oval shape facing the subreflector.

3,820,117

## FREQUENCY EXTENSION OF CIRCULARLY POLARIZED ANTENNA

Roger D. Hall, Encino, and Robert P. Johnson, Granda Hills, both of Calif., assignors to The Bendix Corporation, North Hollywood, Calif.

Filed Dec. 26, 1972, Ser. No. 318,137
Int. Cl. H01q 9/26, 1/38
U.S. Cl. 343—802 6 Claims



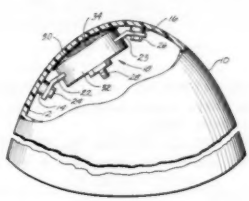

The frequency response of a cavity-backed planar microwave antenna having an element including a pair of spiral antenna tracks fixed to a substrate of insulating material is substantially extended by connecting a pair of cavity-backed outwardly extending dipole elements to the outer ends of each of said spiral tracks. The lower range of useful frequency response is thereby changed from a minimum operating frequency wherein the diameter of the spiral tracks constitutes approximately one-half wave length to a value wherein one-half wave length is approximately equal to the width of the antenna elements including the dipoles. This composite structure may be curved to some degree to enable it to conform to the inside surface of a curved radome.

3,820,118

## ANTENNA AND INTERFACE STRUCTURE FOR USE WITH RADOMES

Roger D. Hall, Encino, Calif., assignor to The Bendix Corporation, North Hollywood, Calif.

Filed Dec. 8, 1972, Ser. No. 313,286
Int. Cl. H01q 1/42, 1/12
U.S. Cl. 343—872 5 Claims

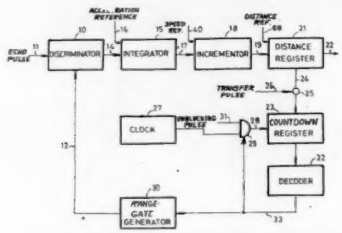


Where a planar microwave antenna is installed inside a curved radome, there is usually space between the surface of the antenna and the inside of the radome which forms a discontinuity adversely affecting performance. The antenna element can be formed over a domed substrate which takes up much of this space, but the curvature of the substrate and that of the radome seldom match so that a significant space still exists. A sheet of flexible, compressible material having a dielectric constant and dissipation factor substantially the same as that of the radome is interposed between the antenna and the radome to take up any space so that no significant discontinuity exists between the face of the antenna and the outside face of the radome.

## 3,820,119
## TRACKING AND HOMING RADAR WITH DIGITAL REGISTER FOR THE STORAGE OF DISTANCE INFORMATION

**Robert Casse, Paris; Henri Robin, Louveciennes, and Gilbert Vallas, Croissy-sur-Seine, all of France, assignors to Electronique Marcel Dassault, Paris, France**

**Continuation-in-part of Ser. No. 14,546, Feb. 26, 1970, abandoned. This application Oct. 19, 1972, Ser. No. 299,016**
**Int. Cl. G01s 9/16**
**U.S. Cl. 343—7.3** **19 Claims**

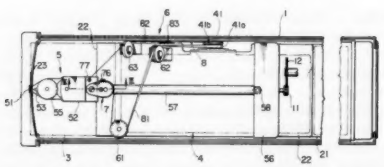



A system computing the distance of a reflecting object from the position of an echo pulse within a range gate or telemetering window includes, as the second one of two cascaded integrators, an incrementor for converting the output voltage of the first integrator into a train of counting pulses with a cadence proportional to speed, these counting pulses being fed to a distance register which is periodically discharged into a countdown register to provide a pulse count proportional to distance. The countdown register is progressively read out by clock pulses over a period beginning with the emission of a high-frequency burst by the radar transmitter and ending upon the attainment of a zero count, or possibly a negative count establishing the lower limit of a range gate, as determined by an associated decoder controlling the telemetering-window generator. The output voltage of the decoder may be used to ascertain, with the aid of a comparator receiving a fixed reference voltage, the instant when a craft equipped with the radar system approaches a target to within a critical distance whereupon the first integrator is disconnected from the radar receiver to operate as a speed memory on the basis of data previously stored therein; the decoder output then continues its decrease, by extrapolation, in accordance with the diminishing target distance until another comparator gives rise to a firing pulse detonating a charge aboard the craft.

## 3,820,120
## RECORDER HAVING PEN ARM DRIVE MEMBERS

**Kazuo Yamada, Tokyo, Japan, assignor to Yokoyawa Electric Works, Ltd., Tokyo, Japan**

**Filed Aug. 23, 1973, Ser. No. 390,927**
**Claims priority, application Japan, Sept. 6, 1972, 47-89297**
**Int. Cl. G01d 5/02**
**U.S. Cl. 346—139 B** **11 Claims**



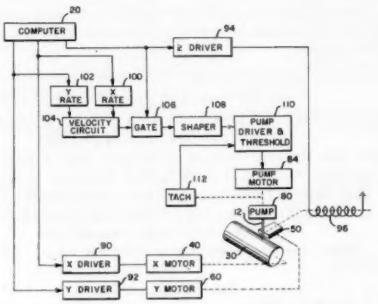
A recording meter for recording data on a chart and adapted to dampen the effects of external vibration and shock including a pen arm, pivotally mounted at one end and equipped with a recording element at the other end, and flexible extensible and flexible inextensible driving members for driving the pen arm. The extensible driving member is coupled to one side of the pen arm and the inextensible driving member is coupled to the opposite side of the pen arm. Drive means including a servomotor, are provided to drive the extensible and inextensible driving members which in turn drive the pen arm.

Components of this recording meter are constructed so that the error due to recording data on a linear scale with a recording element that moves in an arcuate path, i.e. the scale error, is substantially equal and opposite to the error associated with the drive mechanism, i.e. the drive error. In particular, the components of this recording meter are constructed so that the linear displacement, $L_1$, of the inextensible driving member required to effect one-half scale pen arm deflection, is one-half the linear displacement, $L_2$, of that same inextensible driving member required to effect full-scale pen arm deflection.

## 3,820,121
## APPARATUS FOR EXPRESSING A WRITING FLUID

**Leonard G. Rich, and Heinz Joseph Gerber, both of West Hartford, Conn., assignors to The Gerber Scientific Instrument Company, South Windsor, Conn.**

**Filed Oct. 13, 1972, Ser. No. 297,285**
**Int. Cl. G01d 15/16**
**U.S. Cl. 346—140** **11 Claims**




In a plotting device, a plotting pen and a recording medium are moved relative to one another in accordance with plotting commands to cause the pen to produce a line trace on the medium. A pump is connected to the pen to pressurize the writing fluid in the pen and thereby increase the rate at which the writing fluid is expressed during high speed plotting operations. The pump is driven by a motor controlled in accordance with the rate of relative movement between the pen and recording medium so that the writing fluid in the pen is pressurized by the pump exclusively at higher plotting speeds. With the additional pressurization the pen is capable of dispensing writing fluid to produce continuous and uniform lines at both low and high plotting speeds.

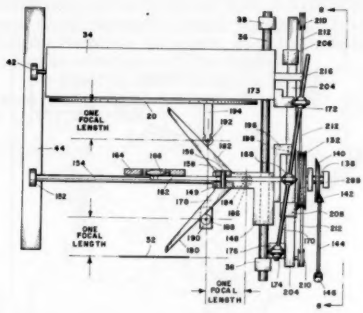
## 3,820,122
## PHOTOTYPESETTING MACHINE

**Harry L. Hosterman, Akron, Ohio, assignor to Portage Newspaper Supply Company, Akron, Ohio**

**Filed Aug. 16, 1971, Ser. No. 171,941**
**Int. Cl. B41b 21/18**
**U.S. Cl. 354—15** **19 Claims**

The invention disclosed is a machine for projecting letters and other characters onto a strip of photographic material to

form headlines and the like. The machine includes a disc having a number of concentric rings or fonts of characters which is spun at a constant high speed, a strobe light mounted on the opposite side of the disc from the paper and energized by a control circuit to project a desired character onto the paper, and a lens system for focusing the projected image. The disc and strobe assembly are slidable toward and away from the paper to vary the size of the image projected and, through a cam, move the lens to maintain proper focusing. A novel




mounting arrangement maintains the optical center of the lens on the line from a reference point on the paper to a reference point on the letter to be projected so that a uniform horizontal reference line and uniform letter spacing are maintained regardless of the size of the letters projected. Vertical shifting of the font disc relative to the strobe light and the lens selects the particular font of characters to be projected. A paper drive system is incorporated to advance the paper a distance proportional to the size of the letter projected.

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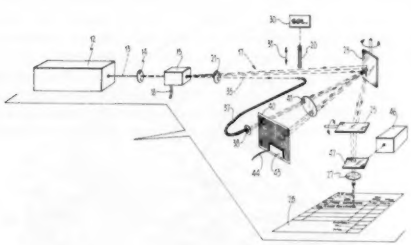
**3,820,123**
**LASER MICROFILM RECORDER**
**Stephen K. Ammann, Cupertino, Calif., assignor to Quantor Corporation, Mountain View, Calif.**
**Filed Apr. 4, 1973, Ser. No. 347,752**
**Int. Cl. B41b** *17/14*
**U.S. Cl. 354—7** **11 Claims**



An optical printer system for producing microfilm hard copy from information signals presented at a high data rate. An entire frame of information is printed line-by-line, each line being recorded character-by-character, each character being recorded column-by-column from a potential M-by-N matrix array by sweeping a column of M selectively actuated narrow beams of coherent light derived from a single laser source transversely of the film and successively repositioning the column in the longitudinal direction. A transverse position detector provides precise positioning signals for initiating generation of successive characters so that each character is precisely positioned on the film within an accuracy of the width of a single beam column space. A form image is projected onto the film at the end of a complete frame of characters. The accuracy of character positioning provided by the system ensures character alignment with the form image. The intensity of the character formation beams permits the use of dry process photographic film.

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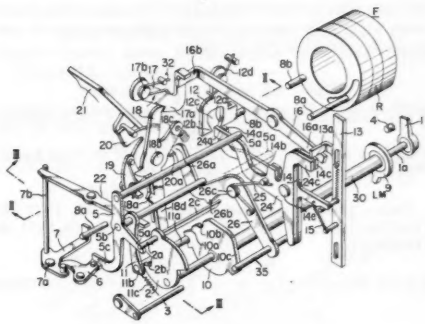
**3,820,124**
**ANTI-MISFUNCTION DEVICE FOR A SINGLE LENS REFLEX CAMERA**
**Tatsuya Taguchi, Tokyo, and Yukio Iura, Yokosuka, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**
**Filed Jan. 31, 1973, Ser. No. 328,411**
**Claims priority, application Japan, Feb. 8, 1972, 47-13760**
**Int. Cl. G03b** *19/12*
**U.S. Cl. 354—23** **5 Claims**



In a single lens reflex camera interchangeably using two types of interchangeable lenses, i.e. for open photometry and for stopped-down photometry, and having an exposure determining device capable of measuring light by a system suited to each of the two types of lenses, a misfunction preventing device comprises a different discriminator member provided in each of the lenses and cooperable with manually operable aperture means to control release blocking means so that shutter release may be prevented when an inappropriate photometric operation has been effected.

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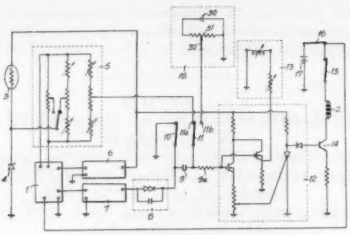
**3,820,125**
**ELECTRIC CAMERA SHUTTER WITH MANUAL CONTROLS**
**Seinan Miyakawa, Tokyo, Japan, assignor to Asahi Kohaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan**
**Filed May 9, 1972, Ser. No. 251,763**
**Claims priority, application Japan, May 19, 1971, 46-39720**
**Int. Cl. G03b** *7/08*
**U.S. Cl. 354—51** **3 Claims**

A camera capable of determining exposure either manually or automatically. Thus, the camera has circuitry for automatically determining the extent to which film in the camera is exposed, and this circuitry is adapted to receive signals corresponding to exposure-determining factors. A pair of signal-transmitting assemblies are provided for transmitting the signals to the circuitry, and one of these assemblies provides signals according to the lighting conditions while the other provides a manually selected signal. A switch is capable of connecting either of these assemblies to the circuitry so that it becomes possible while utilizing the same circuitry to deter-

mine the extent of exposure either automatically in response to various exposure-determining factors or in response to a



manually selected signal which is then introduced into the circuitry which then operates in exactly the same way for automatically determining the exposure.

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**3,820,126**

## ELECTRICAL SYSTEMS FOR CONTROLLING CAMERA SHUTTERS

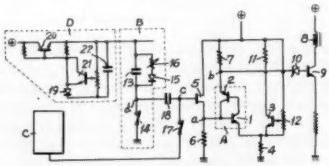
**Yoshiharu Haratake, Niiza, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan**

**Filed Dec. 15, 1972, Ser. No. 315,653**

**Claims priority, application Japan, Dec. 20, 1971, 46-119407[U]; Dec. 20, 1971, 46-119408[U]; Dec. 20, 1971, 46-119409[U]**

**Int. Cl. G03b** *7/08*

**U.S. Cl. 354—24** **9 Claims**



An electrical system for controlling a camera shutter. The electrical system includes a memory capacitor charged according to such information as light intensity, diaphragm, aperture, and film speed. This memory capacitor is electrically connected with a timing capacitor to bias the latter, and the timing capacitor forms part of a logarithmic expansion circuit and is initially charged by a constant voltage power source circuit. The timing capacitor is discharged simultaneously with the opening of the camera shutter and an FET is electrically connected through the memory capacitor to the timing capacitor to be operated thereby, this FET being electrically connected to a trigger circuit for triggering the latter to control the operation of an electromagnet which in response to triggering of the trigger circuit brings about closing of the shutter. A control is provided for controlling the operation of at least one of the above circuits. Thus, in the case of the supply circuit for the timing capacitor and the trigger circuit the control will compensate for temperature fluctuation while in the case of the logarithmic expansion circuit the control will provide a linear discharge characteristic for the timing capacitor even though the discharge circuit for the latter includes an element such as a diode which has a non-linear characteristic.

**3,820,127**

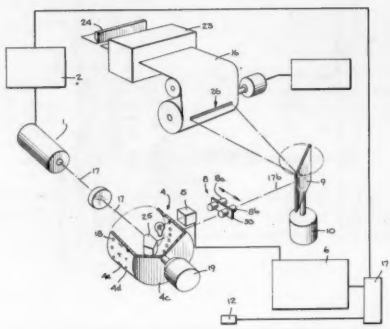
## PHOTOCOMPOSING MACHINE WITH MAGNIFICATION MECHANISM

**David J. Sinnott, Ringwood, and Donald E. Alecci, Pine Brook, both of N.J., assignors to Star-New Era, Inc., South Hackensack, N.J.**

**Filed July 5, 1972, Ser. No. 269,195**

**Int. Cl. B41b** *21/26*

**U.S. Cl. 354—12** **9 Claims**



The use of a pair of lenses for projecting a letter and giving it a different magnification. The lenses are slidable from one position to another.

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**3,820,128**

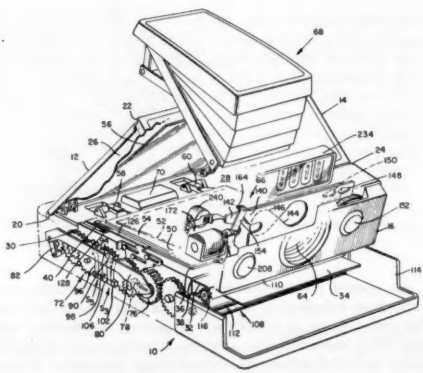
## FLASH PHOTOGRAPHIC CONTROL SYSTEM

**John P. Burgarella, Sudbury; Peter P. Carcia, Reading, and Richard C. Kee, Chestnut Hill, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.**

**Continuation-in-part of Ser. No. 246,891, April 24, 1972, abandoned. This application Feb. 16, 1973, Ser. No. 333,331**

**Int. Cl. G03b** *7/08*

**U.S. Cl. 354—32** **44 Claims**



A flash photographic control system for use within a highly automatic reflex camera of a variety utilizing a flash firing cir-

cuit in conjunction with a packaged array of flashlamps. The firing circuit ignites the flashlamps sequentially in a predetermined order from first to last. The control system is characterized in electrically isolating the firing circuit during portions of a photographic cycle during which it would otherwise be subjected to spurious signals or noise effects. Additionally, an arrangement is provided wherein the control system overrides the flash firing network under select scene conditions of high brightness.

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**3,820,129**

## FOCUSING DEVICE FOR OPTICAL INSTRUMENTS

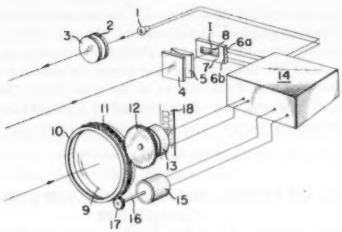
**Kazuya Hosoe, Kawasaki; Seiichi Matsumoto, Tokyo, and Noritaka Mochizuki, Kamakura, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Filed May 26, 1972, Ser. No. 257,138**

**Claims priority, application Japan, June 1, 1971, 46-37991; June 1, 1971, 46-37992**

**Int. Cl. G03b** *3/10*

**U.S. Cl. 354—25** **23 Claims**



A focusing device for optical instruments such as cinecameras and the like includes a ray receiving optical system for transmitting therethrough a beam of radiation such as light coming in from an object and for forming such radiation beam into an image, photoelectric converter means for receiving the radiation from the object through said optical system and converting the same into an electrical signal, and an electric circuit for receiving the signal from the photoconverter means to produce a signal necessary to control an image forming optical system which is adjustable for focusing. The ray receiving optical system converges the radiation beam from the object to form a single image on the photoelectric converter means. The photoelectric converter means comprises a photoelectric converter element having at least two photoelectric converter portions functioning individually but contiguous with each other along a confine therebetween. The focused condition accomplished by the said device may be displayed within the viewfinder of an optical instrument.

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**3,820,130**

## GOLF INSTRUCTION DEVICE

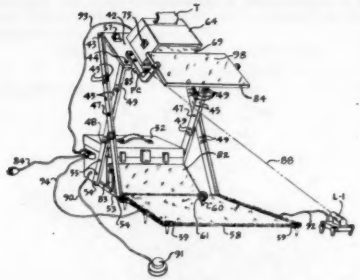
**Floyd S. Cornelison, Jr., and Robert L. Turner, both of 244 S. 9th St., Philadelphia, Pa. 19107**

**Filed July 5, 1973, Ser. No. 376,434**

**Int. Cl. G03b** *19/02*

**U.S. Cl. 354—34** **15 Claims**

Apparatus is disclosed for golf instruction utilizing a golf club with illuminated lines for quickly available photographic recording and development with respect to a reference line, the recorded pattern of the swing before, when and after the club strikes the ball showing the nature of the swing, the position of the golf club head and the speed of the head.



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**3,820,131**

## ELECTRONIC SHUTTER FOR CAMERA

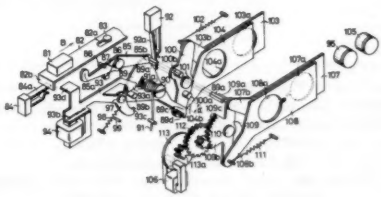
**Harumi Tanaka, Kobe, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan**

**Filed June 29, 1973, Ser. No. 374,836**

**Claims priority, application Japan, July 10, 1972, 47-69281; July 18, 1972, 47-72186; July 18, 1972, 47-72187**

**Int. Cl. G03b** *7/08, 9/14, 9/62*

**U.S. Cl. 354—38** **16 Claims**



An electronic shutter includes an electromagnet under the control of an exposure time control electric circuit to control the forward movement of a shutter drive member and to thereby control the exposure time, and operation delaying means for eliminating the influence of the delayed actions of the electromagnet and of an attraction member during the period after the drive member has been initiated into operation until the shutter starts to open so as to stabilize the operation of the shutter at a high speed. The shutter further includes a diaphragm mechanism for determining the diaphragm aperture size in accordance with the brightness of the subject to enable the shutter to operate as a program shutter of the constant shutter speed type for subjects whose brightness is higher than a specified value and as a program shutter of the shutter speed control type with the diaphragm aperture fully opened for subjects having a lower brightness.

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**3,820,132**

## EXPOSURE SETTING DEVICE IN PHOTOGRAPHIC APPARATUS

**Fritz Lindner, Diedlung, Germany, assignor to PEN PENTACON DRESDEN Kamera-und Kinowerke, Dresden, Germany**

**Continuation of Ser. No. 131,259, April 5, 1971, abandoned. This application May 14, 1973, Ser. No. 359,847**

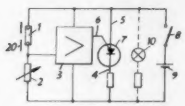
**Claims priority, application Germany, Sept. 11, 1970 W P 57a/151126**

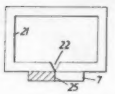
**Int. Cl. G03b** *7/02*

**U.S. Cl. 354—53** **3 Claims**

The device for setting exposures in photographic apparatus is provided with a light indicator by which the set exposure

factor combination is indicated as corresponding to under-exposure, over exposure or the correct exposure. The indicator is provided with a luminous surface the light-dark egee of which is displaceable in dependence upon the brightness of





the subject and the exposure factor combination set. The light-dark edge can be aligned from opposite directions with a linear or punctiform fixed mark which is arranged directly adjacent the luminous surface and along the range of movement of the light-dark edge.

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**3,820,133**

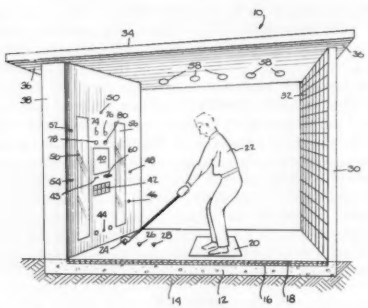
## TEACHING DEVICE

**Charles S. Adorney, 61 Mallard Dr., and William H. Davis, 88 W. Brother Dr., Greenwich, both of Conn. 06830**

**Filed July 24, 1972, Ser. No. 274,465**

**Int. Cl. G03b *19/02*; A63b *69/36***

**U.S. Cl. 354—60** **5 Claims**



A teaching device for making a permanent record of the movement of a participant in action, which includes a stall having a front instrument panel, a camera mounted on the instrument panel directly in front of the participant, a plurality of electric eyes, mounted on the instrument panel at preselected spaced locations, being actuatable by the movement of the participant, and an electrical control circuit for sequentially actuating the shutter of the camera responsive to actuation by the electric eyes.

**3,820,134**

## TERRAIN MODEL VIEWING DEVICE

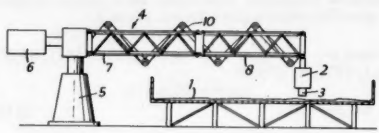
**Raymond Charles Wilton, Worthing, and Peter James Astley, Pulborough, both of England, assignors to The Singer Company (U.K.) Ltd., London, England**

**Division of Ser. No. 861,669, Sept. 29, 1969, Pat. No. 3,643,345. This application Dec. 17, 1971, Ser. No. 209,055**

**Claims priority, application Great Britain, Oct. 1, 1968, 46543/68The portion of the term of this patent subsequent to Feb. 22, 1989, has been disclaimed.**

**Int. Cl. G03b *17/56***

**U.S. Cl. 354—81** **4 Claims**



A terrain model viewing device for an aircraft flight simulator comprises an articulated arm mounting a camera at its free end and having its other end pivotally mounted on a base to one side of the model in the case where the model is horizontal or above or below the model in the case where the model is vertical. The arm can be connected to a guide tract attached to a moveable gantry. Also two articulated arms can be used.

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**3,820,135**

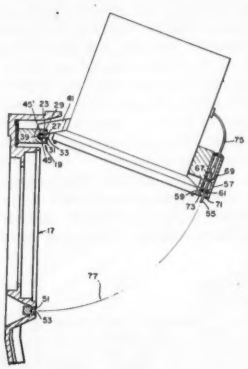
## MANUALLY OPERABLE MECHANIC AND ELECTRICAL CONNECTOR

**Colin G. Dickson, Los Altos, Calif., assignor to Spectrotherm Corporation, Santa Clara, Calif.**

**Filed Mar. 27, 1972, Ser. No. 238,259**

**Int. Cl. G03b *29/00***

**U.S. Cl. 354—81** **12 Claims**



Apparatus for mechanically and electrically interconnecting two devices, such as an electronic visual display device an a photographic camera attachment assembly. A hinge pivot bar attached to one of the devices has a circular bore extending along its length and an elongated slot opening the bore to the outside. A pivot shaft attached to the other of the devices is circular of a diameter to fit within the circular bore of the hinge pivot bar and further includes a pair of parallel surfaces

permitting the pivot shaft to be inserted through the slot of the hinge pivot bar thereby forming the mechanical connection. Mating electrical connector elements are provided on the two devices for electrical interconnection therebetween as the mechanical connection is being effected.

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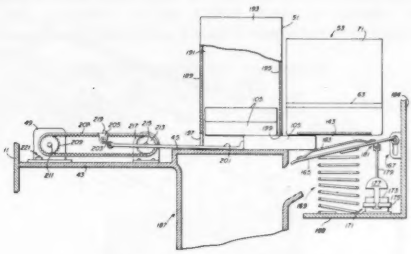
**3,820,136**

**AUTOMATIC PHOTOSTUDIO COMPRISING AUTOMATIC FILM CASSETTE CHANGING APPARATUS**

**C. Bruce Kennedy, Acton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.**

**Filed Jan. 8, 1973, Ser. No. 321,667**
**Int. Cl. G03b** *17/50*
**U.S. Cl. 354—81** **6 Claims**



An automatic photostudio for taking self-portraits under studio lighting conditions and delivering a finished processed print to the user immediately after exposure.

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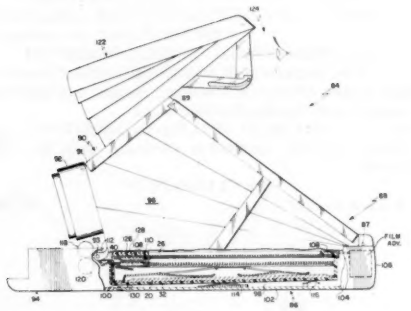
**3,820,137**

**PHOTOGRAPHIC APPARATUS**

**John J. Driscoll, Andover, Mass., assignor to Polaroid Corporation, Cambridge, Mass.**

**Filed Apr. 24, 1973, Ser. No. 354,007**
**Int. Cl. G03b** *17/50*
**U.S. Cl. 354—86** **9 Claims**



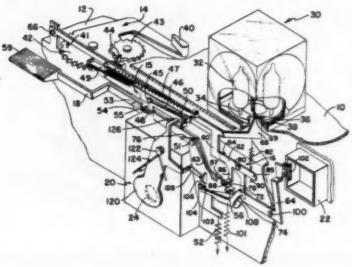
Photographic apparatus for use with a photographic film assemblage including at least one "self-developing" film unit. The assemblage includes a container having a relatively flexible forward wall supporting one or more members for controlling the distribution of a fluid processing composition used to treat a film unit as it is advanced through a withdrawal slot in the container. The apparatus includes structure therein for deflecting a portion of the forward wall near the withdrawal slot to urge the distribution control members into operative engagement with a film unit being advanced through the withdrawal slot.

**3,820,138**

**SHUTTER MECHANISM FOR FLASH AND DAYLIGHT MODE OPERATION**

**William Howard Horton, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Oct. 24, 1972, Ser. No. 299,971**
**Int. Cl. G03b** *19/02, 15/04*
**U.S. Cl. 354—142** **1 Claim**



Photographic apparatus has a shutter mechanism and a pair of shutter drivers for selectively actuating the shutter mechanism in a flash or a daylight mode. Each shutter driver is independently driven and is releasable in response to depression of a body release lever in the photographic apparatus to cause shutter actuation.

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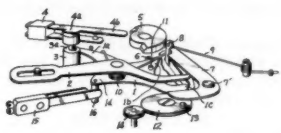
**3,820,139**

**SHUTTER RELEASE MEANS IN A SINGLE LENS REFLEX CAMERA HAVING AN AUTOMATIC EXPOSURE TIME CONTROL OF INNER LIGHT MEASURING SYSTEM**

**Katsuhiko Nomura, Kawagoe; Naoyuki Uno, Iruma; Tadazumi Sakazaki, Tokyo; Koichiro Watanabe, Tokyo, and Fumio Urano, Tokyo, all of Japan, assignors to Asahi Kogoku Kogyo Kabushiki Kaisha, Tokyo-to, Japan**

**Filed Aug. 14, 1972, Ser. No. 280,332**
**Claims priority, application Japan, Aug. 16, 1971, 46-72708**
**Int. Cl. G03b** *3/00*
**U.S. Cl. 354—152** **1 Claim**

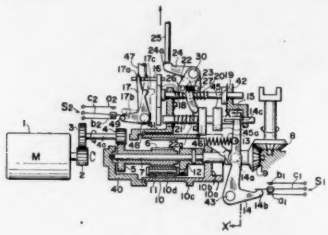


A single lens reflex camera includes a snap-up mirror, a shutter curtain, a shutter curtain actuating button and an automatic exposure time control system which includes an exposure time memory circuit. The camera includes means for charging the shutter curtain and rotatable lever, and associated with the lever, a spring urges the lever means in a predetermined direction. The shutter button maintains the lever in initial position against the urging of the spring and releases the lever, allowing the lever to be urged and thereby rotate in the predetermined direction upon actuation of the shutter actuating button. A memory circuit changeover control switch is actuated by the lever rotating in a predetermined direction. A mechanism is actuated by the rotation of the lever in a predetermined direction after the switch is actuating for actuating the snap-up mirror or the shutter curtain in operative association with the lever and subsequently returns the lever to its initial position.

## 3,820,140
## AUTOMATIC FILM WINDING AND SHUTTER COCKING MECHANISM

**Kaoru Umeda, Osaka, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka-shi, Osaka-fu, Japan**

**Filed Oct. 27, 1972, Ser. No. 301,512**
**Claims priority, application Japan, Oct. 30, 1971, 46-100495; Nov. 25, 1971, 46-94085**
**Int. Cl. G03b** *19/04*
**U.S. Cl. 354—171** **14 Claims**

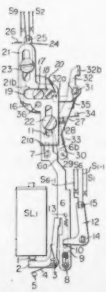


An electric motor effects the winding of a film and the cocking of a shutter. A film winding control mechanism comprises a cam operated in accordance with the load exerted on a film winding shaft whereby the cam operates with the winding load exceeding a predetermined value and ceases operation with the winding load below said predetermined value after completion of both the cocking of the shutter and the winding of the film. A detecting lever is mounted to be positioned within the travel path of a shutter release controlling member during the period from the initiation of film winding until the completion of the film winding and is retracted from that travel path during the time from completion of the film winding until completion of exposure. When the winding of the entire film has been completed prior to the cocking of the shutter, the cam is actuated by the increased load on the film winding shaft whereby the detecting lever is actuated by movement of the release controlling shaft resulting from movement of the cam. The drive of the motor or the rewinding of the film by the drive motor is thereby automatically accomplished.

## 3,820,141
## CAMERA DRIVING CONTROL DEVICE

**Hiroshi Aizawa, Tokyo, and Mitsutoshi Ogiso, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan**

**Continuation of Ser. No. 127,970, March 25, 1971, abandoned. This application Dec. 26, 1972, Ser. No. 318,427**
**Claims priority, application Japan, Mar. 26, 1970, 45-25738; Nov. 17, 1970, 45-101199**
**Int. Cl. G03b** *19/04*
**U.S. Cl. 354—171** **21 Claims**

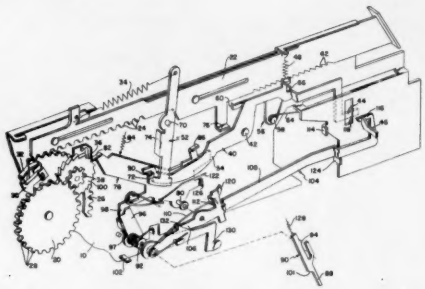


When the film windup mechanism of a camera reaches a given point a control slider is engaged by a control lever to move a locking lever mounted on the control lever from its locking position for releasing a motor to rotate. The motor drives a release slider in a reciprocating motion such that the shutter is released by its forward motion and the locking lever is returned to its locking position by the return motion of the release slider.

## 3,820,142
## CAMERA

**David E. Beach, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.**

**Filed Mar. 12, 1973, Ser. No. 340,420**
**Int. Cl. G03b** *19/04*
**U.S. Cl. 354—206** **6 Claims**

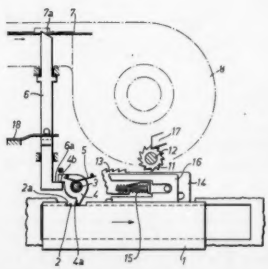


A camera for perforated film includes film transport means which is disabled when a fresh film frame is in registry with the camera's exposure area. A shutter release member is operable to effect exposure of the film. A blocking member is urged to a first position by a spring permitting operation of the shutter release member. A second spring urges the blocking member to a second position preventing operation of the shutter release member when the transport means is not disabled. The blocking member is automatically moved to its first position whenever a cartridge is not located in the camera.

## 3,820,143
## SHUTTER COCKING AND FILM TRANSPORT MECHANISM FOR A ROLL FILM CAMERA

**Heinz Keiner, Oberndorf, Germany, assignor to Firma Ernst Leitz GmbH, Wetzlar, Germany**

**Filed May 25, 1973, Ser. No. 364,147**
**Claims priority, application Germany, July 24, 1972, 2236255**
**Int. Cl. G03b** *19/04*
**U.S. Cl. 354—206** **5 Claims**



Shutter cocking and film transport mechanism for a roll film camera wherein film cartridges are particularly used, and

wherein the film transport is effected with the advance and return strokes of a reciprocating operating slide, the improvement comprising a portion of the shutter cocking and film transport mechanism being used for the film transport consisting of an operating slide (1) traversing a constant path, which is accessible to the user, and a drive element (14) traversing paths of different lengths; and a resilient compensating member (15) is provided between the operating slide (1) and the drive element (14). The compensating member maintains both parts at a distance and bridges their path differences resulting from the increase in diameter of the wound-up film.

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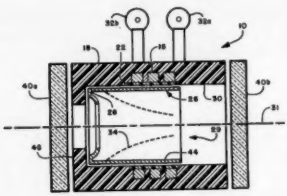
**3,820,144**
**ELECTROMECHANICAL SHUTTER**

**Eugene L. Neau, and Arthur R. VanHook, both of Livermore, Calif., assignors to The United States of America as represented by the Atomic Energy Commission, Washington, D.C.**

**Filed Oct. 1, 1973, Ser. No. 402,554**
**Int. Cl. G03b 9/00**
**U.S. Cl. 354—234** **4 Claims**



A fast, large aperture electromechanical shutter which uses a magnetically driven collapsing tubular, metal cylinder shutter arrangement is described.

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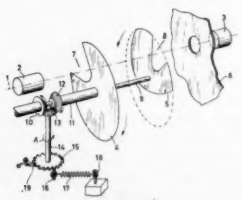
**3,820,145**
**SHUTTER FOR PHOTOGRAPHIC CAMERA**

**Pierre Gaullier, Houilles, France, assignor to U. S. Philips Corporation, New York, N.Y.**

**Filed May 17, 1973, Ser. No. 361,192**
**Claims priority, application France, May 18, 1972, 72.17874**
**Int. Cl. G03b 9/14**
**U.S. Cl. 354—250** **4 Claims**

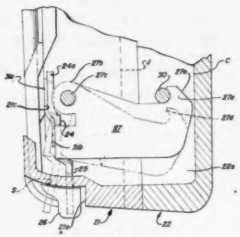


This shutter consists of two closely spaced discs, each provided with an aperture and arranged so that the apertures, when they coincide, are located on the optical axis of the objective. These discs are driven by a shaft which is integral with a crank, whose crank pin is attached to a spring. The apertures coincide when during an exposure the discs have their maximum speed of rotation.

**3,820,146**
**LATCH ASSEMBLY**

**Israel Nesson, Fairlawn; Edwin E. Faris, Wkckoff, and Ronald Spezial, Vale, all of N.J., assignors to Berkey Photo, Inc., Paramus, N.J.**

**Filed Sept. 8, 1972, Ser. No. 287,573**
**Int. Cl. G03b 19/02**
**U.S. Cl. 354—288** **6 Claims**



A latch assembly is provided for use on a camera or the like to retain complemental housing sections in a closed relation so as to form an opaque chamber in which film is disposed. The latch assembly includes an elongated latch pivotally mounted on one housing section and a first lock component mounted on the second housing section. The latch is biaed to assume a predetermined position of pivotal adjustment and is provided with a first portion secured to the one housing section, a second portion extending laterally therefrom and terminating at the exterior of the one housing section, and a second lock component extending from the first portion and interlockingly engaging the first lock component when said housing sections are in closed relation and the latch is in said predetermined position of pivotal adjustment. The second portion of the latch is adapted to be manually manipulated to effect unlocking of the first and second lock components.

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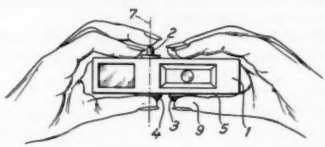
**3,820,147**
**BOX-SHAPED STILL CAMERA**

**Ernst Feindler, Laufdorf, and Heinz Keiner, Oberndorf, both of Germany, assignors to Ernt Leitz GmbH, Wetzlar, Germany**

**Filed Mar. 8, 1973, Ser. No. 339,157**
**Claims priority, application Germany, Mar. 15, 1972, 2212475**
**Int. Cl. G03b 19/02**
**U.S. Cl. 354—288** **5 Claims**



A box-shaped photographic still camera has a picture taking lens on one narrow side of the camera housing, side by side with the objective lens of the combined view- and rangefinder. The ocular lens of the latter is arranged on the opposite narrow housing side. In the picture taking position the camera is to be held by both hands. A first knob for setting the diaphragm aperture and a second knob for setting the picture taking lens to the object distance are arranged on the lower side of the camera housing. The arrangement is such that in the usual picture taking position the thumb of the one hand in

the natural supporting position rests against the first setting knob and the thumb of the other hand rests against the second setting knob. Additionally, the film advance and shutter tensioning member is so arranged on the lower side of the camera housing that it may be actuated by the thumb of one hand by merely moving the thumb from the setting knob to the lever without changing the position of the hand.

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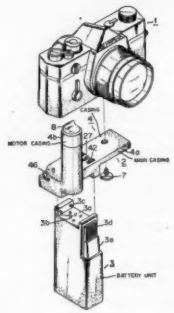
**3,820,148**
**MOTOR DRIVE DEVICES FOR CAMERAS**
**Akira Osanai, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan**
**Filed June 13, 1973, Ser. No. 369,701**
**Claims priority, application Japan, June 16, 1972, 47-71285; Oct. 28, 1972, 47-123845**
**Int. Cl. G03b** *19/04*
**U.S. Cl. 354—295** **14 Claims**




A motor drive device is attached to the camera to automatically drive a film windup mechanism and shutter releasing mechanism. The device has two connected casings, one receiving a motor and the other receiving a drive unit. The motor casing is located on the front right side of the camera and used as a grip for holding the camera. The drive unit may drive both mechanisms in turn and is conveniently in a predetermined timing period.

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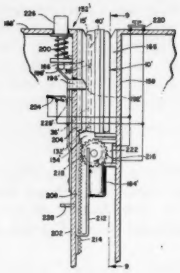
**3,820,149**
**SYSTEM FOR RUPTURING POD CONTAINING PROCESSING FLUID FOR PHOTOGRAPHIC MATERIAL**
**Philip G. Baker, Peabody; Gerald H. Cook, Lynnfield, and Rogers B. Downey, Lexington, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.**
**Division of Ser. No. 838,783, July 3, 1969, Pat. No. 3,687,051. This application June 1, 1972, Ser. No. 258,844**
**Int. Cl. G03d** *3/16, 5/02*
**U.S. Cl. 354—317** **10 Claims**

A system for rupturing a pod having a weakened edge portion and containing processing fluid for photographic material and for expelling the fluid therefrom. The fluid filled pod is mounted adjacent a support surface and protected by a flexible cover plate. A rigid member is initially disposed between the cover plate and the support surface adjacent the end of the rupturable pod furtherest removed from the pod's weakened portion. Extending along the inside face of the cover plate is a rib which initially presses the section of the pod adjacent thereto against the support plate so that substantially no fluid is disposed within the pod between the rib and the support plate. The cover plate includes access openings whereby externally mounted force applying members may be introduced into the space between the cover plate and the support surface to displace the rod across the length of the pod. The cover plate is deflected by the rod during its displacement across the pod and at the same time presses the rod firmly against the pod. This system can advantageously be employed in a compact multi-purpose film handling cassette adapted to be inserted into a unique processor-projector unit containing the aforementioned force applying members.



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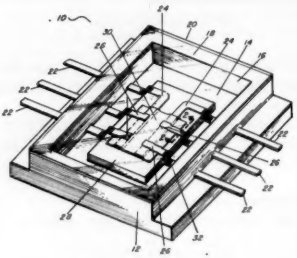
**3,820,150**
**TEMPERATURE INSENSITIVE DOPED AMORPHOUS THIN FILM SWITCHING AND MEMORY DEVICE**
**Ruth Nicolaides, Andover, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.**
**Filed Aug. 1, 1972, Ser. No. 276,997**
**Int. Cl. H01l** *3/16;* **H01c** *7/10*
**U.S. Cl. 357—2** **14 Claims**

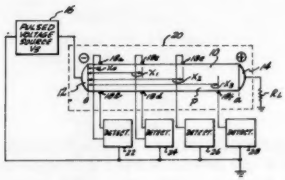


This invention relates to a semi-conductor switching and memory device having a threshold or breakdown voltage which is relatively insensitive to environmental temperatures which range from approximately −35° to 130°C. and nuclear radiation after exposure to $1.3 \times 10^{17}$ n/cm. In addition to the temperature insensitivity and radiation hardness characteristics of the present invention, the device exhibits a symmetrical positive and negative voltage limiting or voltage regulating phenomena in its "off" state current-voltage characteristic and also exhibits in its memory mode a very short setting and resetting time. The present device has a doped chalcogenide amorphous thin film material positioned adjacent two electrodes. The semi-conductor is deposited on an insulating substrate which is fixedly held in a sealed, nitrogen containing "flat pack" type ceramic container. The electrodes of the semi-conductor are electrically coupled to hermetically sealed electrical terminal feed-throughs of a container.

## 3,820,151
## FAST SEQUENTIAL SWITCH WITH ADJUSTABLE DELAY

**Betsy Ancker-Johnson, Seattle, Wash., and Charles L. Dick, Jr., New York, N.Y., assignors to The Boeing Company, Seattle, Wash.**

**Filed Sept. 21, 1972, Ser. No. 290,836**
**Int. Cl. H01I** *13/00*
**U.S. Cl. 357—13** **8 Claims**

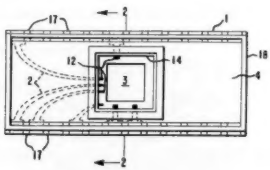



A fast sequential switch utilizes a relatively long sample of p-type material, such as indium antimonide, which is capable of impact ionization activated by injected electrons. A high average electric field is created in the device by an external pulsed voltage source. Electron injection may be from the source, by the photoelectric effect, or the like. The injected electrons produce an impact ionization wavefront which travels the length of the device from cathode to anode in a very short period of time, on the order of 1.4 nanoseconds for a device 1.83 mm long. The wavefront is accompanied by a drastic decrease in the localized electric field and resistance behind the wavefront. A plurality of side contacts or probes located along the length of the device are connected to a corresponding plurality of detectors which may monitor either the device's potential or resistance. When the impact ionization wavefront passes the location of a particular contact or probe, the detector is switched on and maintained on until the biasing pulse terminates. Probes displaced by approximately 1 mm are activated approximately 0.3 nanoseconds apart.

## 3,820,152
## CIRCUIT PACKAGE WITH FUGITIVE SHORTING BAR

**Charles Lawrence Booth, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.**

**Filed Apr. 24, 1973, Ser. No. 354,129**
**Int. Cl. H01I** *3/00, 5/00*
**U.S. Cl. 357—74** **4 Claims**



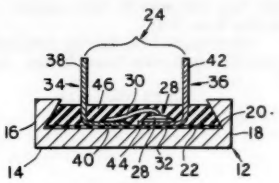
A semiconductor package having a metallized fugitive shorting bar across the conductor pads or leads to prevent electrical damage to a semiconductor chip, inserted therein, from static electricity discharges, and a process for packaging a semiconductor chip and removing the shorting bar by solder leaching are provided. The shorting bar is screen printed as a thick-film metallized strip or bar across the conductor lead attach pads or lead frame of the semiconductor package. After a semiconductor chip is inserted in the package by the semiconductor manufacturer and the chip attached and sealed, the shorting bar may be removed at the same time the leads are soldered to the package by the solder leaching properties of a tin-lead-silver or tin-lead solder.

Silver is the preferred material of the shorting bar since it is readily compatible with tin-lead-silver or tin-lead solder. However, gold, tin, lead or any thick film material readily dissolved or leached by the solder may be used.

## 3,820,153
## PLURALITY OF SEMICONDUCTOR ELEMENTS MOUNTED ON COMMON BASE

**Frederic R. Quinn, Red Hook, N.Y., assignor to Zyrotron Industries, Inc., South Hackensack, N.J.**

**Filed Aug. 28, 1972, Ser. No. 284,272**
**Int. Cl. H01I** *5/00, 3/00*
**U.S. Cl. 357—81** **6 Claims**



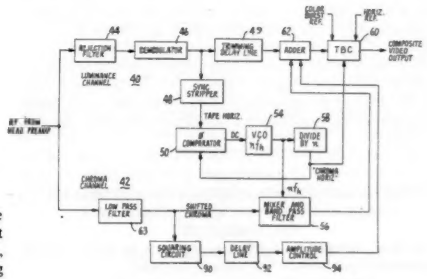

The array comprising a metallic base having a high thermal conductivity which receives a first layer of material having a high thermal conductivity and low electrical conductivity. A plurality of semiconductor elements are mounted on the first layer of material in juxtaposition to each other and a second layer of material having the same characteristics as the first layer of material covers the first layer of material and the semiconductor elements.

A method of fabricating the array of semiconductor elements also is disclosed.

## 3,820,154
## PHASED COLOR UNDER VIDEO RECORDING AND PLAYBACK METHOD AND APPARATUS

**Yves Charles Faroudja, Los Altos Hills, and Leonard Kowal, Saratoga, both of Calif., assignors to International Video Corporation, Sunnyvale, Calif.**

**Filed Aug. 25, 1972, Ser. No. 283,700**
**Int. Cl. H04n** *5/78*
**U.S. Cl. 358—8** **9 Claims**




An improved "color under" video recording and playback system which provides a phased color composite video signal having a wide band luminance component. In playback, the long term time base variations experienced by the lower

frequency luminance information are introduced into the frequency shifted chroma and high frequency luminance information, which frequency shifted chroma and high frequency luminance information experiences less phase variations due to its lower recording frequency. The output signal has stable chroma for excellent color fidelity and stable high frequency luminance for excellent edge definition. Low frequency luminance information contains some uncorrected time base error which is not visible if the tape transport is within certain practical limits of stability relative to short term TBE's. A cancellation or interlace technique reduces synchronous distortion from the shifted color subcarrier.

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**3,820,155**

## TELEVISION RECEIVER SERVICE ADJUSTMENT SYSTEM

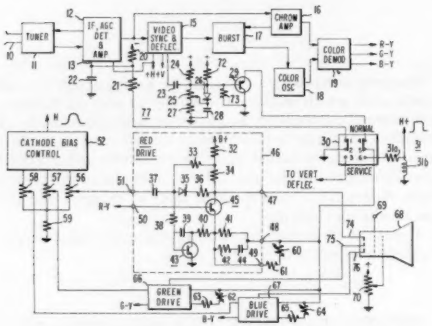
**David Lynn Neal, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.**

**Filed May 8, 1973, Ser. No. 358,294**

**Claims priority, application Great Britain, Aug. 29, 1972, 40080/72**

**Int. Cl. H04n** *9/18*

**U.S. Cl. 178—5.4 TE** **8 Claims**




Apparatus for providing auxiliary reference signals useful in setting up the cutoff points of each of a plurality of electron guns in a color kinescope or picture tube. The reference signals are substituted in place of luminance signals by means of a service switch having at least "normal" and "service" positions. In the service or set-up mode of operation, with the reference signals applied and vertical scan collapsed, the screen grid to cathode voltage of each of the guns is adjusted to produce a dim white line on the kinescope. The polarity and amplitude of the reference signals is selected so that, upon return of the service switch to normal position and reconnection of the luminance signal channel, the conduction of each of the electron guns is decreased. As a result, the cutoff points of the guns correspond closely to luminance signal black level.

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**3,820,156**

## METHOD AND ARRANGEMENT FOR AUTOMATIC PHASE AND AMPLITUDE CONTROL IN A VECTORSCOPE

**Axel Schulz, Darmstadt, Germany, assignor to Robert Bosch Fernsehanlagen GmbH, Darmstadt, Germany**

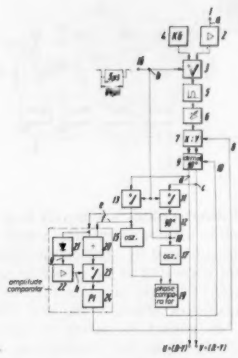
**Filed Mar. 28, 1973, Ser. No. 345,786**

**Claims priority, application Germany, Jan. 14, 1972, 2200202**

**Int. Cl. H04n** *9/02*

**U.S. Cl. 358—10** **9 Claims**

A switch automatically connects a circular test signal to the input of the bandpass amplifier in the vectorscope during the horizontal flyback time of the composite television signal whose color signals are to be displayed on the vectorscope. The combined signal is fed through the standard vectorscope stages to the demodulator output at which are furnished the B-Y and R-Y signals. Also connected to each of the demodulator outputs is a switch operated in synchronism with the switch inserting the circular test signal into the composite television signal. The output of the switch connected to the R-Y demodulator is fed through a 90° phase shift stage and then




serves to synchronize a first oscillator. The output of the second switch synchronizes a second oscillator and the two oscillator outputs are fed into a phase comparator stage whose output in turn controls the phase shift in the demodulator. Amplitude comparison of the phase shifted signal and the signal at the output of the second switch connected to the B-Y output of the demodulator results in a first control signal which varies the gain of the amplifier amplifying the chrominance signal from which the B-Y signal will be derived.

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**3,820,157**

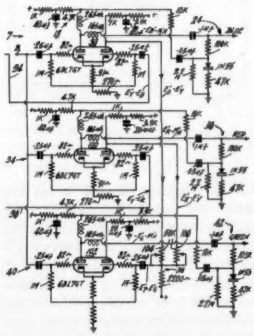
## COLOR TELEVISION

**Dalton H. Pritchard, Princeton, N.J., and Alfred C. Schroeder, Huntingdon Valley, Pa., assignors to Radio Corporation of America, Princeton, N.J.**

**Filed July 25, 1952, Ser. No. 300,855**

**Int. Cl. H04n** *9/02*

**U.S. Cl. 358—30** **5 Claims**



Color television signal detection apparatus utilizing only two synchronous detectors, the output signals of the two de-

tectors, being combined with each other to derive a third signal of the same type as that provided by the synchronous detectors themselves, each of these signals then being combined with the luminance signal to provide the three desired signals representative of the color components.

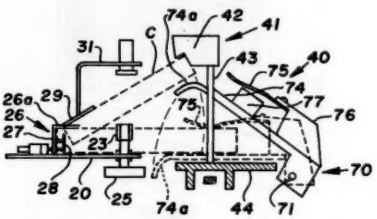
## ERRATUM

For Class 360—51 see:
Patent No. 3,819,281

### 3,820,158
### CARTRIDGE LOADING AND POSITIONING MECHANISM FOR TAPE PLAYING DEVICE

**Wayne E. Schober, Minneapolis, Minn., assignor to Telex Communications, Inc., Minneapolis, Minn.**

**Filed May 22, 1972, Ser. No. 255,261**
**Int. Cl. G11b** *23/04*
**U.S. Cl. 360—96** **18 Claims**



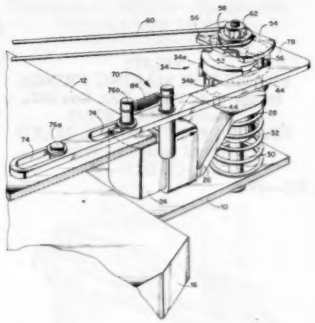

A loading and positioning mechanism for tape players and the like which includes a front loading plate having a key-type aperture oriented to introduce a tape containing mechanism, such as a cartridge, at a predetermined angle and having guiding means to receive the tape cartridge at this orientation. The guide means is rotatable to transfer the tape cartridge into playing position so that the cartridge, or carrier, engages the driving mechanisms the player. The magnetic head of the player is carried by such rotatable guide means and is thereby properly positioned against the tape for proper reproduction thereof. The device further includes means for ejecting the tape carrier by a reversal of the operation.

### 3,820,159
### FINE TUNING AND RESET MECHANISM FOR TAPE PLAYERS AND THE LIKE

**Allan L. Saunders, Melrose, Mass., assignor to Automatic Radio Mfg. Co., Inc., Melrose, Mass.**

**Filed Nov. 8, 1972, Ser. No. 304,742**
**Int. Cl. G11b** *5/56, 21/08*
**U.S. Cl. 360—106** **9 Claims**

In a cartridge-type tape player, an adjustment mechanism for manually fine-tuning the transducer head by means of a control which is accessible from the exterior of the tape player. The adjustment mechanism has associated therewith a

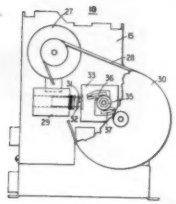


reset mechanism which automatically cancels the fine-tuning adjustments previously made to the transducer head when the tape cartridge is removed from the player.

### 3,820,160
### INDEXING MECHANISM

**William B. Huber, Park Forest, Ill., assignor to Motorola, Inc., Franklin Park, Ill.**

**Division of Ser. No. 834,076, June 17, 1969. This application Aug. 19, 1971, Ser. No. 173,216**
**Int. Cl. G11b** *5/56*
**U.S. Cl. 360—106** **4 Claims**



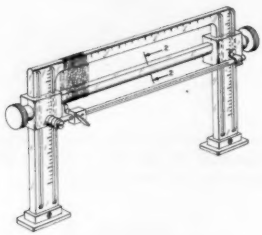
A pawl and ratchet device actuated by a solenoid for rotating the cam of a cartridge-type tape player to position the magnetic tape head adjacent different tracks on the tape includes a unitary plastic pawl element having an opening therein for receiving the ratchet wheel and further having first and second pawls integrally formed as part of the pawl element and attached to the sides of the opening thereof by a restricted portion forming a spring biasing the pawls into engagement with the ratchet. Surfaces are provided on opposite sides of the opening in the pawl element for engaging the ratchet wheel in the extreme positions of motion of the element in both directions to prevent further rotation of the ratchet at the limits of movement of the element.

### 3,820,161
### Patent Not Issued For This Number

# DESIGNS

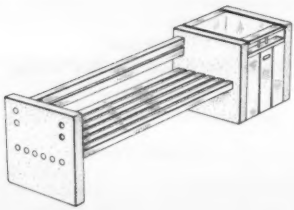
JUNE 25, 1974

231,871
**FRAME FOR MAKING FRINGE**
Jeannette L. Webb, P.O. Box 287, Madison, N.J. 07940
Filed May 8, 1972, Ser. No. 251,576
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D3—19 A

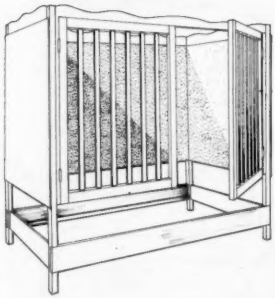


231,872
**ORTHODONTIC TOOTH BRUSH**
Frederick W. Spaulding, 14 Myrtle St., Manchester, Conn. 06040
Filed Jan. 10, 1973, Ser. No. 322,417
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—25

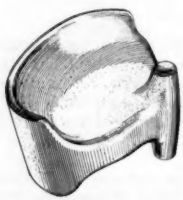
231,873
**COMBINED BENCH AND CONTAINER MODULE**
Donald G. King, 241 Dickson Park Crescent, Mississauga, Ontario, Canada
Filed Nov. 30, 1971, Ser. No. 203,512
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—4



231,874
**SECURITY ENCLOSURE FOR A BED**
Leslie J. Weigel, Cincinnati, Ohio, Elmer A. Wolfzorn, Fort Thomas, Ky., and Charles Riley, Cincinnati, Ohio, assignors to Manual Arts Furniture Company, Cincinnati, Ohio
Filed Apr. 17, 1972, Ser. No. 245,011
Term of patent 7 years
Int. Cl. D6—*01*
U.S. Cl. D6—14

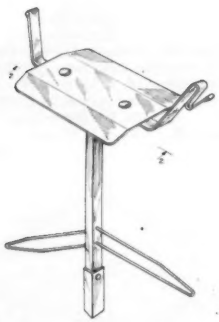


231,875
**SEAT**
Jess Miller, 1701 Northcrest, Arlington, Tex. 76010
Filed Nov. 24, 1972, Ser. No. 309,197
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—17



231,876
RACK PRIMARILY FOR HOLDING MAGAZINES IN SUSPENDED POSITION
James T. Jenkins, Apt. 303, 401 Chaplin St. SE., Washington, D.C. 20019
Filed Oct. 24, 1972, Ser. No. 300,310
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—28

231,877
SUPPORT RACK FOR A GARDEN HOSE
Wallace D. Houchen, 3027 N. Sullivan Ave., Rosemead, Calif. 91770
Filed July 26, 1971, Ser. No. 165,880
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—29

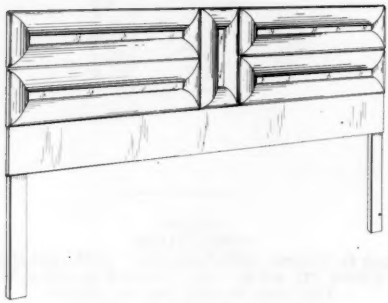


231,878
MOBILE LOUNGE CHAIR
Thomas Boyd Kellum, 2426 Wild Valley Drive, Jackson, Miss. 39211
Filed Sept. 5, 1972, Ser. No. 286,094
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—39

231,879
TIRE CHAIR
Joseph O. Veillette, 1854 Ocean Ave. 11230, and Harvey S. Citron, 322 4th St. 11215, both of Brooklyn, N.Y.
Filed Nov. 20, 1972, Ser. No. 308,260
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—68

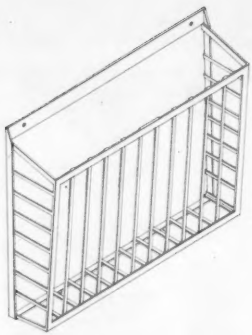
231,880
MODULAR CHAIR
David Weinstock, 116 W. 81st St., New York, N.Y. 10024
Continuation-in-part of design application Ser. No. 22,288, Apr. 6, 1970. This application June 28, 1971, Ser. No. 157,806
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—26

231,881
BED HEADBOARD
Roland P. Carter, Lynchburg, Va., assignor to The Lane Company, Inc., Altavista, Va.
Filed July 17, 1973, Ser. No. 379,943
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—79

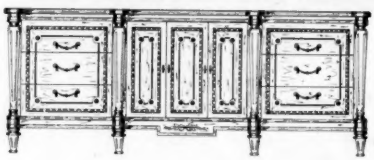


231,882
TISSUE DISPENSER
Louis D. Perret III, Box 417, St. Charles Parish, La. 70047
Filed July 25, 1972, Ser. No. 274,862
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—96

231,883
STORAGE RACK
Roy G. Kramer, 1342 Signal Drive, Pomona, Calif. 91767
Filed Dec. 18, 1972, Ser. No. 316,089
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—130



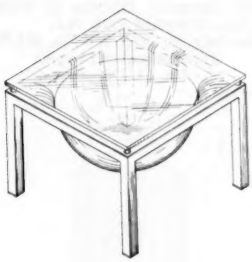
231,884
DRESSER OR THE LIKE
Huey T. Keller, 1609 Davidson Road, High Point, N.C. 27260
Filed Mar. 8, 1972, Ser. No. 233,012
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—164



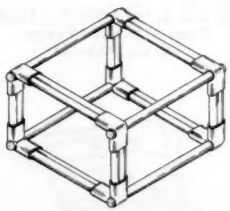
231,885
TABLE
Lynn H. Kephart, 2109 Skylark St., Arlington, Tex. 76010
Filed May 24, 1973, Ser. No. 363,442
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—175

231,886
TABLE
Lynn H. Kephart, 2109 Skylark St., Arlington, Tex. 76010
Filed Nov. 13, 1972, Ser. No. 306,264
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—175

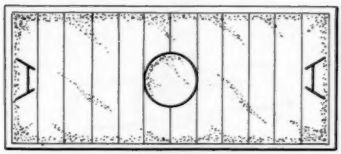
231,887
TABLE
Lynn H. Kephart, 2109 Skylark St., Arlington, Tex. 76010
Filed Nov. 13, 1972, Ser. No. 306,263
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—175



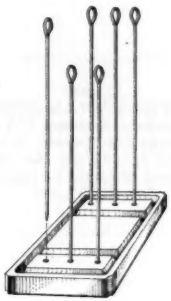
231,888
TABLE FRAME
John W. Caldwell, 1829 Warwick Road, San Marino, Calif. 91108
Continuation of abandoned design applications Ser. No. 133,470 and Ser. No. 133,471, both Apr. 12, 1971. This application Aug. 22, 1973, Ser. No. 390,412
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—192



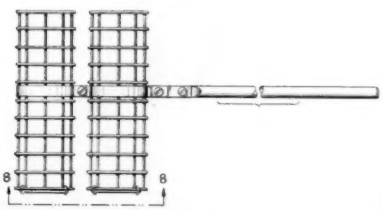
231,889
FOOD BOWL TRAY
John F. Krieger, Grafton, and Robert S. Block, Village of Bayside, Wis., assignors to Breakthru Incorporated, Milwaukee, Wis.
Filed Oct. 27, 1971, Ser. No. 193,235
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—37



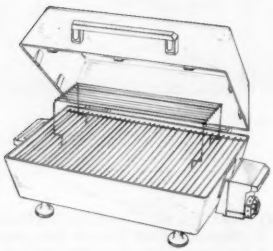
231,890
COMBINED SKEWER SET AND CUTTING BOARD
Robert E. Kritkausky, Fort Wayne, Ind., asisgnor to K & S Corporation, Fort Wayne, Ind.
Filed Apr. 17, 1972, Ser. No. 245,027
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—46



231,891
HOTDOG ROASTER
Joseph Di Pirro, 122 Freund St., Buffalo, N.Y. 14215
Filed Nov. 24, 1972, Ser. No. 308,933
Term of patent 7 years
Int. Cl. D7—*02*
U.S. Cl. D7—95

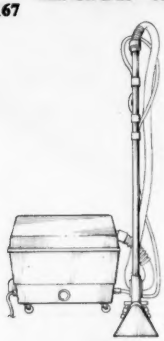


231,892
ELECTRIC GRILL
Martin Warshauer, Fair Haven, N.J., assignor to Electric Char-B-Que, Inc., Red Bank, N.J.
Filed Feb. 22, 1972, Ser. No. 228,481
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—110



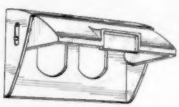
231,893
SPOON OR SIMILAR ARTICLE
Ellen B. Manderfield, Syracuse, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed Oct. 4, 1972, Ser. No. 298,792
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—137

231,894
CARPET CLEANER UNIT
Arlen M. Knight, 845 Cieneguitas Road, Santa Barbara, Calif. 93110
Filed June 8, 1972, Ser. No. 261,132
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D7—167



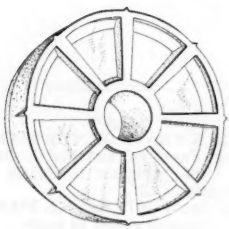
231,895
COMBINATION LOCK
Edward M. Stolarz, Yorktown Heights, N.Y., assignor to Presto Lock Company, Division of Walter Kidde & Company, Inc., Elmwood Park, N.J.
Filed July 30, 1973, Ser. No. 383,566
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—114

231,896
COMBINED COVER AND HOODED MOUNTING PLATE ASSEMBLY FOR AN ELECTRICAL JUNCTION BOX
Paul J. Zerwes, deceased, late of Chicago, Ill., by Helen E. Zerwes, Chicago, Ill., assignor to Bell Electric Company, Chicago, Ill.
Filed June 2, 1972, Ser. No. 262,926
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D8—179



231,897
MOCK HINGE STRAP
Raymond U. H. Tegner, Lodi, Wis., assignor to Amerock Corporation, Rockford, Ill.
Continuation-in-part of abandoned design applications Ser. No. 209,501 and Ser. No. 209,502, both Dec. 17, 1971. This application Dec. 6, 1972, Ser. No. 312,781
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—202

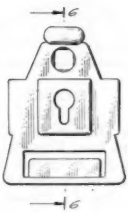
231,898
CENTER PLUG FOR A PAPER ROLL CORE
Erik Saxén, Helsinki, Finland, assignor to Oy Takuuvalmiste Ab., Helsinki, Finland
Filed Feb. 28, 1973, Ser. No. 336,526
Claims priority, application Finland Jan. 19, 1973
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D8—220



231,899
DOOR BRACKET
Kenneth E. Hewson, 626 Colony Drive, Troy, Mich. 48084
Filed July 18, 1973, Ser. No. 380,288
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—233

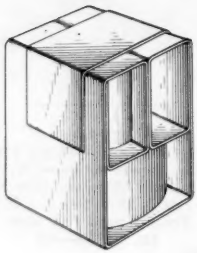
231,900
ADJUSTABLE DOOR SUPPORT
Kenneth E. Hewson, 626 Colony Drive, Troy, Mich. 48084
Filed July 18, 1973, Ser. No. 380,287
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—233

231,901
BRACKET FOR PICTURE FRAME
Maxwell Bentley, North Bellmore, N.Y., assignor to Delsemme's Artist Materials, New York, N.Y.
Filed Jan. 3, 1972, Ser. No. 215,274
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—258

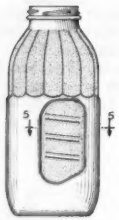


231,902
STRIP OF STAPLES
Robert E. Olson, 9014 Callaghan Road, San Antonio, Tex. 78230
Filed May 18, 1972, Ser. No. 254,834
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—266

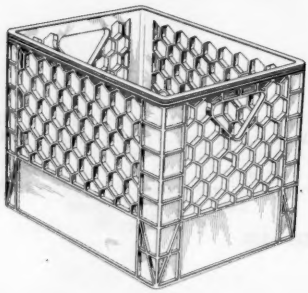
231,903
COMBINED BOTTLE AND DISPLAY CARTON THEREFOR
Charles H. Berman, 2405 Braeburn, Flossmoor, Ill. 60422
Filed Mar. 20, 1972, Ser. No. 236,552
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—12



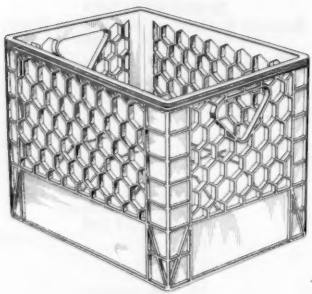
231,904
BOTTLE
Joseph Boden, Chicago, Ill., assignor to Boden Products, Inc., Franklin Park, Ill.
Filed Oct. 30, 1972, Ser. No. 301,943
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—44



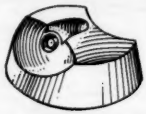
231,905
MILK CRATE OR THE LIKE
Houston Rehrig, Pasadena, and Bud E. Sanders, North Hollywood, Calif., assignors to Rehrig Pacific Company, Los Angeles, Calif.
Continuation-in-part of design application Ser. No. 298,909, Oct. 4, 1972. This application May 30, 1973, Ser. No. 365,377
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—177



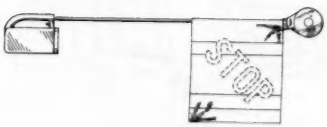
231,906
MILK CRATE OR THE LIKE
Houston Rehrig, Pasadena, and Bud E. Sanders, North Hollywood, Calif., assignors to Rehrig Pacific Company, Los Angeles, Calif.
Filed Oct. 4, 1972, Ser. No. 298,909
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—177



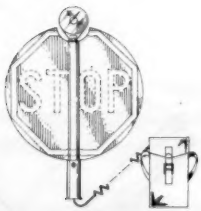
231,907
AEROSOL ACTUATOR
William C. Harris, Racine, Wis., assignor to S. C. Johnson & Son, Racine, Wis.
Filed Aug. 14, 1972, Ser. No. 280,640
Term of patent 14 years
Int. Cl. D9—*02*
U.S. Cl. D9—258



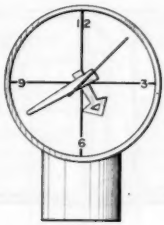
231,908
HAND-HELD COMBINED CAUTION FLAG AND BLINKING WARNING LIGHT FOR SCHOOL CHILDREN CROSSINGS
William W. Allington, P.O. Box 567, Kent, Wash. 98031
Filed Nov. 2, 1972, Ser. No. 303,224
Term of patent 14 years
Int. Cl. D29—*02*; D10—*06*
U.S. Cl. D10—114



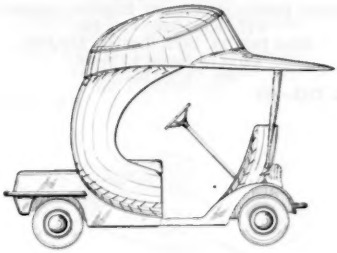

231,909
COMBINED HAND-HELD WARNING SIGN AND BLINKING LIGHT AND BATTERY CASE THEREFOR
William W. Allington, P.O. Box 567, Kent, Wash. 98031
Filed Nov. 2, 1972, Ser. No. 303,222
Term of patent 14 years
Int. Cl. D29—*02*; D10—*06*
U.S. Cl. D10—114



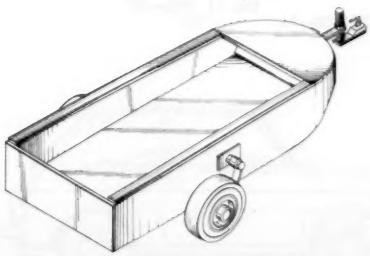

231,910
CLOCK OR SIMILAR ARTICLE
Mark Wallach, 220 E. 63rd St., New York, N.Y. 10021
Filed Feb. 8, 1972, Ser. No. 224,645
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—23



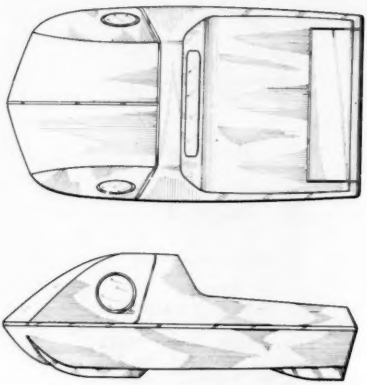

231,911
NOVELTY CART
Joseph M. Baker, 438 S. Elm Drive, Beverly Hills, Calif. 90212
Filed July 21, 1972, Ser. No. 274,003
Term of patent 7 years
Int. Cl. D12—*08*
U.S. Cl. D12—1



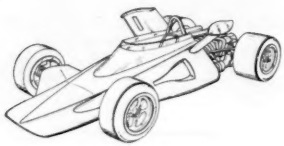
231,912
COMBINED BOAT AND TRAILER
Dale E. Cooper, Main at Boise, Emmett, Idaho 83617
Filed Aug. 28, 1972, Ser. No. 284,188
Term of patent 14 years
Int. Cl. D12—*06, 10*
U.S. Cl. D12—2



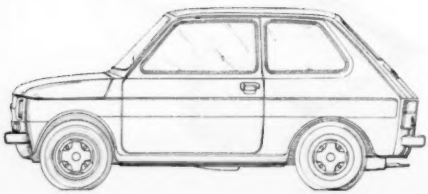
231,913
**MOBILE AMPHIBIOUS CAMPING CAPSULE**
Toshihiko Sakow, 82 Copley Ave., Teaneck, N.J. 07666
Filed Jan. 24, 1972, Ser. No. 220,554
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D12—3



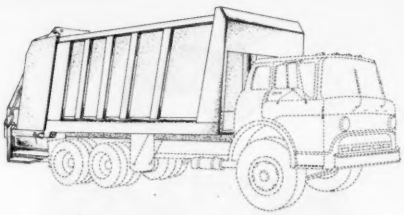
231,914
**RACING CAR**
Maurice Phillipe, Hethersett, England, assignor to Vel's Ford Sales Co., Inc.
Filed Feb. 14, 1972, Ser. No. 226,380
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—88



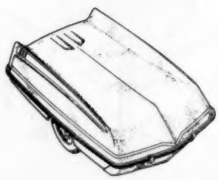
231,915
**AUTOMOBILE**
Gian Paolo Boano, Turin, Italy, assignor to Fiat Societa per Azioni, Turin, Italy
Filed Oct. 20, 1972, Ser. No. 299,577
Claims priority, application Italy Apr. 27, 1972
Term of patent 7 years
Int. Cl. D12—*08*
U.S. Cl. D12—91



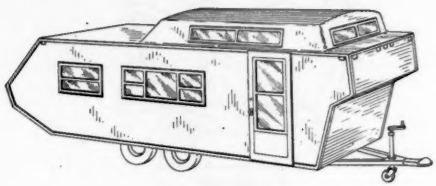
231,916
**REFUSE TRUCK BODY**
Fred T. Smith, Dearborn Heights, Mich., assignor to Sargent Industries, Wayne, Mich.
Filed May 15, 1972, Ser. No. 253,684
Term of patent 14 years
Int. Cl. D12—*13*
U.S. Cl. D12—93



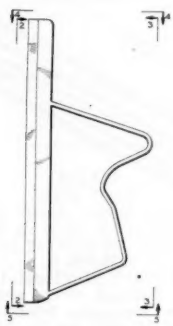
231,917
**TRAILER**
Satoru Nozaki, Toyota, and Fukuo Matsui, Yokohama, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota-shi, Aichi-ken, Japan
Filed Feb. 20, 1973, Ser. No. 333,725
Claims priority, application Japan Oct. 20, 1972
Term of patent 14 years
Int. Cl. D12—*10*
U.S. Cl. D12—102



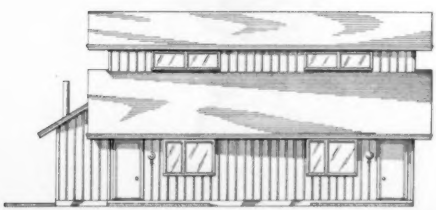
231,918
TRAILER
Cecil R. Smith, Thayer, Kans. (Box 679, Indian Head Terrace, North Little Rock, Ark. 72117)
Filed June 1, 1972, Ser. No. 258,942
Term of patent 14 years
Int. Cl. D12—*10*
U.S. Cl. D12—103



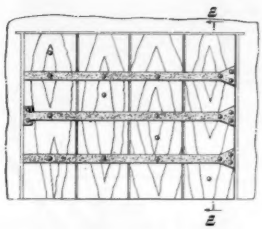
231,919
BUMPER ATTACHMENT FOR VEHICLES
Larry C. Bruhn, 280 S. 2nd, Springfield, Oreg. 97477
Filed Oct. 25, 1972, Ser. No. 300,806
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—167



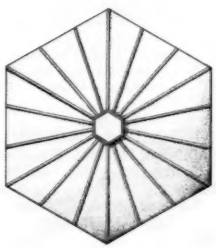
231,920
APARTMENT BUILDING
Charles J. Thomas, 8083 Forest Lake Drive, Youngstown, Ohio 44512
Filed Oct. 30, 1972, Ser. No. 302,566
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D13—1 A



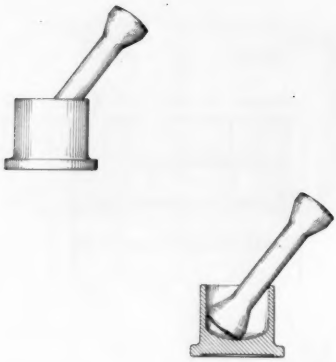
231,921
FOLDING GARAGE DOOR
Fred L. Rosenbaum, 4944 Ajax, El Paso, Tex. 79924
Filed Oct. 2, 1972, Ser. No. 294,499
Term of patent 14 years
Int. Cl. D25—*00*
U.S. Cl. D13—1 M



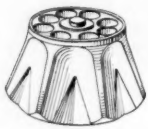
231,922
BUILDING ROOF
John D. Cole, 3860 Honey Hill Lane, Dayton, Ohio 45405
Filed Aug. 14, 1972, Ser. No. 280,596
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D13—1 R



231,923
MORTAR AND PESTLE
Melvin L. Johnsrud, 1244 S. 31st St., and John E. Koepke, 1328 S. 24th St., both of Manitowoc, Wis. 54220
Filed June 1, 1972, Ser. No. 258,922
Term of patent 14 years
Int. Cl. D28—*01;* D24—*02*
U.S. Cl. D16—1 R

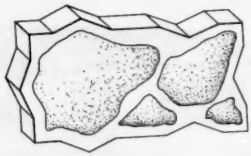


231,924
CENTRIFUGE ROTOR
L. Wayne Pollard, 6619 Huntsman Blvd., Springfield, Va. 22153
Filed July 27, 1973, Ser. No. 383,382
Term of patent 14 years
Int. Cl. D24—*01, 99*
U.S. Cl. D16—2 C

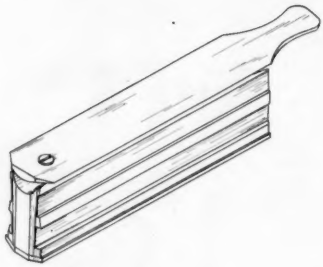


231,925
FISHING ROD HOLDER
F. William Speigel, Jr., 389 Woodland Road, Highland Park, Ill. 60035
Filed June 21, 1973, Ser. No. 372,040
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—22

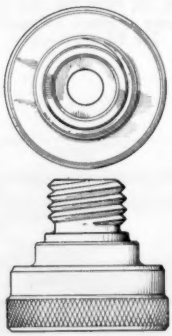
231,926
MASONRY BLOCK
Samuel Alan Appleton, Dytap House, Ruishton, Taunton, Somerset, England
Filed Mar. 9, 1972, Ser. No. 233,400
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D18—2 R



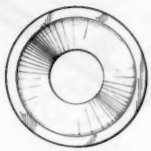
231,927
GAME CALL
Merrel C. Shoemaker, deceased, late of Eldon, Mo., by Gwendolyn O. Shoemaker, surviving spouse, Rte. 1, Eldon, Mo. 65026
Filed June 8, 1972, Ser. No. 261,148
Term of patent 14 years
Int. Cl. D10—*06;* D29—*99*
U.S. Cl. D10—116

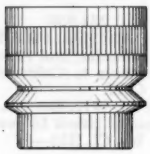


231,928
LIQUID FLOW CONTROL UNIT
Barton R. Nelson, Portland, Oreg., assignor to Nelson Irrigation Corporation, Brimfield, Ill.
Filed Sept. 15, 1971, Ser. No. 180,940
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—1

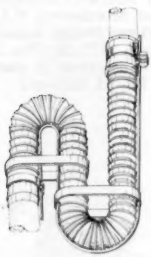


231,929
NOZZLE FOR FAUCETS, CONDUITS, OR THE LIKE
Charles W. Ranson, 7906 Agnew Ave., Los Angeles, Calif. 90045
Filed Sept. 9, 1971, Ser. No. 179,252
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—34





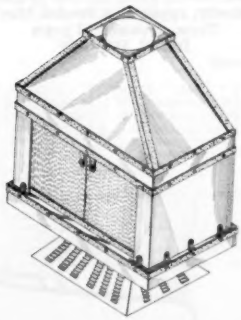
231,930
SINK TRAP
Ernest D. Danks, College Place, Wash. (1416 Topaz St., Walla Walla, Wash. 99362)
Filed Oct. 21, 1971, Ser. No. 191,577
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—46



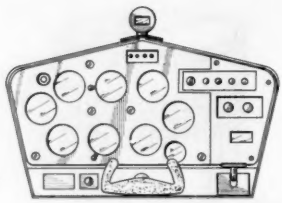
231,931
PORTABLE TOILET
Bernard C. Sharp, White Plains, N.Y., assignor to Sears, Roebuck and Co., Chicago, Ill.
Filed Sept. 25, 1972, Ser. No. 291,590
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—48

231,932
CHILD'S PORTABLE TOILET
Inez L. Smith, 1275 Church St., San Francisco, Calif. 94114
Filed Aug. 14, 1972, Ser. No. 280,190
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—48

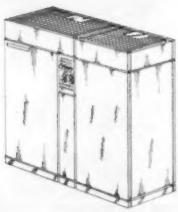
231,933
FIREPLACE
Lyman R. Andrew, Santa Rosa, Calif., assignor to Viking Universal Corporation, Cotati, Calif.
Filed July 5, 1973, Ser. No. 376,548
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97



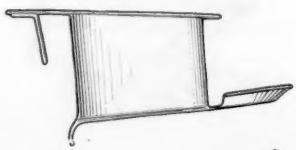
231,934
FLIGHT SIMULATOR
Joseph E. Sidoti, Red Bank, N.J., assignor to Electronic Associates Inc., Long Branch, N.J.
Filed May 19, 1972, Ser. No. 255,316
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D25—1 R



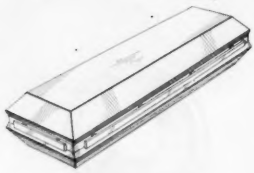
231,935
CABINET FOR DATA PROCESSING EQUIPMENT
Myron F. Davis and Walter Furlani, Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.
Original design application Oct. 26, 1970, Ser. No. 25,659. Divided and this application Aug. 19, 1971, Ser. No. 173,170
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5 C



231,936
TOILET ACCESSORY FOR HOME PETS
Jan Gary Louis Sixten Kullenback, 52 Kabendervagen, S–415 13 Goteborg, Sweden
Filed Nov. 5, 1971, Ser. No. 196,248
Claims priority, application Sweden May 6, 1971
Term of patent 14 years
Int. Cl. D30—*99*
U.S. Cl. D30—99

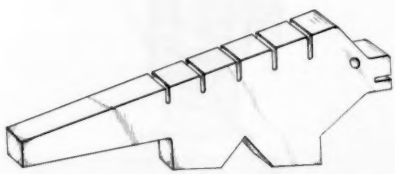


231,937
CASKET
Edward R. Andrus, Jr., Mount Prospect, Dale E. Fahnstrom, Riverside, and James G. Hansen, La Grange, Ill., assignors to Elder Wilbert Corp., Broadview, Ill.
Filed Mar. 20, 1972, Ser. No. 236,536
Term of patent 14 years
Int. Cl. D31
U.S. Cl. D31—3

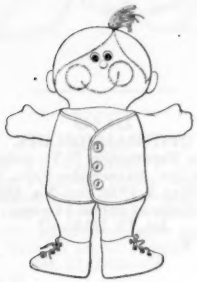


231,938
TOY ANIMAL FIGURE
Jay Smith, Pacific Palisades, and Anson Sims, Redondo Beach, Calif., assignors to California R & D Center, Pacific Palisades, Calif.
Filed July 24, 1972, Ser. No. 274,461
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—2 R

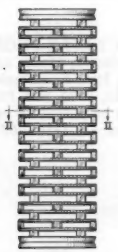
231,939
TOY IGUANA FIGURE
Charles B. Root, Morristown, N.J., assignor to Educational Design Associates
Filed May 8, 1972, Ser. No. 251,568
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—2 R



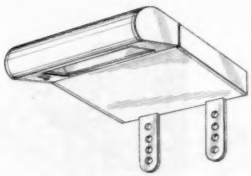
231,940
TOY TRAINING DOLL
Dane B. Coe, Manhattan Beach, Calif., assignor to Innova Incorporated, Playa Del Ray, Calif.
Original design application Dec. 28, 1970, Ser. No. 26,675. Divided and this application Jan. 29, 1973, Ser. No. 327,708
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—4 R



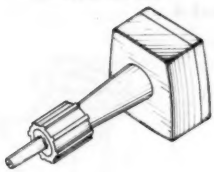
231,941
YARN DYE TUBE
Robert L. Burchette, Jr., 570 El Paso St., Spartanburg, S.C. 29303
Filed Dec. 22, 1972, Ser. No. 317,758
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D47—5



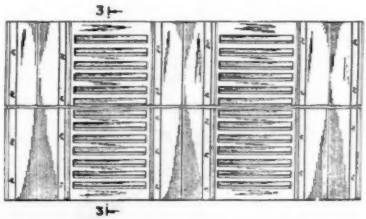
231,942
CORDLESS ILLUMINATION UNIT
Donald J. Cincotta, 7330 Brodiaea, La Jolla, Calif. 92037, and Harold J. Kopelke, 1511 Beryl, San Diego, Calif. 92109
Filed Mar. 16, 1973, Ser. No. 342,062
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—4 B



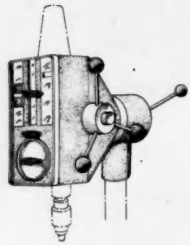
231,943
AUTOMOTIVE CHOKE TESTER OR SIMILAR ARTICLE
Renzo N. Rutili, Albert Lea, Minn., assignor to Owatonna Tool Company, Owatonna, Minn.
Filed Oct. 27, 1972, Ser. No. 301,624
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D52—6 R



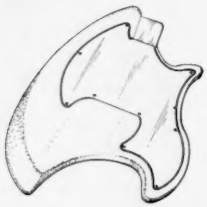
231,944
GRILLE
Patrick Zampetti and Robert Deuchler, Cranford, N.J., assignors to Construction Specialties, Inc., Cranford, N.J.
Original design application Mar. 5, 1970, Ser. No. 21,752, now Patent No. 225,269, dated Nov. 21, 1972. Divided and this application Feb. 3, 1971, Ser. No. 112,503
Term of patent 14 years
Int. Cl. D25—*02*; D23—*03*
U.S. Cl. D54—2 A



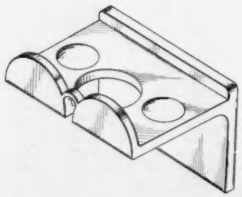
231,945
COMBINATION DRILL PRESS AND ROUTER
Richard Stawowy, Chicago, Ill., assignor to Montgomery Ward & Co., Chicago, Ill.
Filed June 12, 1972, Ser. No. 261,619
Term of patent 7 years
Int. Cl. D15—*09*
U.S. Cl. D54—14 B



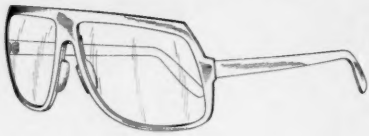
231,946
GUITAR BODY
James H. Rickard, Harwinton, and Robert M. Brody, Winsted, Conn., assignors to Ovation Instruments, Inc., Hartford, Conn.
Filed June 16, 1972, Ser. No. 263,615
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D56—1 A



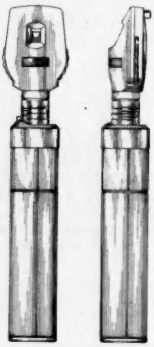
231,947
HOLDER FOR SPECTACLES
Thomas L. Weber, 321 Oak Ave. 6, Redwood City, Calif. 94061
Filed Feb. 9, 1972, Ser. No. 225,015
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D57—1 C



231,948
PAIR OF SPECTACLES
Larry G. Loughner, North Andover, Mass., assignor to American Optical Corporation, Southbridge, Mass.
Filed Sept. 8, 1972, Ser. No. 287,297
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D57—1 F



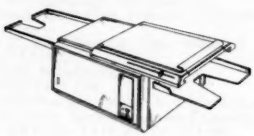
231,949
OPHTHALMOSCOPE
Arthur J. Pulos, Fayetteville, N.Y., assignor to Welch Allyn, Inc., Skaneateles Falls, N.Y.
Filed May 3, 1973, Ser. No. 356,800
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D57—1 E



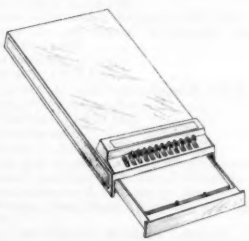
231,950
SPECTACLE FRONT
Jack Bloch, Leominster, Mass., assignor to Foster Grant Co., Inc., Leominster, Mass.
Filed May 21, 1973, Ser. No. 362,032
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D57—1 F

231,951
SPECTACLE FRONT
Jack Bloch, Leominster, Mass., assignor to Foster Grant Co., Inc., Leominster, Mass.
Filed May 21, 1973, Ser. No. 363,239
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D57—1 F

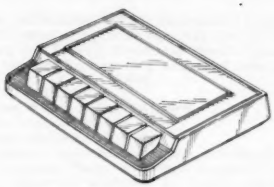
231,952
COPIER
Kazuteru Nagata, Fujisawa, Japan, assignor to Tokyo-Shibaura Electric Co., Ltd., Kawasaki-shi, Japan
Filed Oct. 26, 1971, Ser. No. 192,674
Claims priority, application Japan Apr. 27, 1971
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D61—1 Q



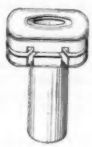
231,953
TELEPHONE INDEX
Richard E. Beger, Point Pleasant, N.J., assignor to The Bates Manufacturing Company, Orange, N.J.
Filed Jan. 2, 1973, Ser. No. 320,295
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D74—1 C



231,954
TELEPHONE INDEX
Francis Grief, London, England, assignor to British & International Proprietaries Limited, London, England
Filed Mar. 1, 1973, Ser. No. 337,218
Claims priority, application Great Britain Sept. 21, 1972
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D74—1 C



231,955
UMBRELLA RUNNER
Heinz Weber, Hilden, Germany, assignor to Telesco Brophey Limited, Montreal, Quebec, Canada
Continuation-in-part of design application Ser. No. 24,601, Aug. 20, 1970. This application Aug. 10, 1971, Ser. No. 170,674
Term of patent 14 years
Int. Cl. D3—*03*
U.S. Cl. D88—3 A



231,956
NOTICE BOARD
Desmond Gerard Meagher, 16 Sussex St., London, England
Filed Jan. 12, 1972, Ser. No. 217,434
Claims priority, application Great Britain July 12, 1971
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D96—4 A

# LIST OF PATENTEES

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## PATENTS WERE ISSUED ON THE 25TH DAY OF JUNE, 1974

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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Aarons, Geoffrey L.; and De Weese, Ralph M., to International Harvester Company. Cushion hitch. 3,819,206, Cl. 280-487.000.

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Abernathy, Timothy G.: *See—*
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Abney, Dave L.; Williams, Robert C.; and Gilbert, Horace E., to Dresser Industries, Inc. Selective well treating and gravel packing apparatus. 3,818,986, Cl. 166-51.000.

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Abrams, Harold B.; Haynes, Benjamin O.; and Williams, Glynn P., to Mylee Digital Sciences, Inc. Display systems for electronic data processing equipment. 3,820,080, Cl. 340-172.500.

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Ackermann, Jacob; and Radici, Pierino, to Societa Italiana Resine S.p.A. Polymer stabilizers prepared from lactams or lactones and phenolic compounds. 3,819,573, Cl. 260-45.90r.

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Adams, George R.; and Meisenbach, William T., to Armstrong Cork Company. Sound-absorbing wedge. 3,819,010, Cl. 181-33.0gd.

Adamski, Diane L.: *See—*
Weber, Fred A.; Caputo, James P.; Eddy, John W.; Harrington, Phil R.; O'Toole, Gerald; Puccini, Sergio E.; and Adamski, Diane L., 3,819,865.

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Adkins, James D.; Bedenbaugh, Angela O.; Bedenbaugh, John H.; and Bergin, Willie A. Conversion of saturated carboxylic acids to N-alkylated aldimines. 3,819,704, Cl. 260-566.00r.

Adlam, Francis Charles, to E. M. Partners A.G. Wall coping. 3,818,663, Cl. 52-300.000.

Adolphi, Heinrich: *See—*
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Urbach, Hans; and Adolphi, Heinrich, 3,819,749.

Adorney, Charles S.; and Davis, William H. Teaching device. 3,820,133, Cl. 354-60.000.

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Aerolite Electronics Corporation: *See—*
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Buseth, Richard A., 3,818,939.

Agence Nationale de Valorisation de la Recherche (Anvar): *See—*
Hadni, Armand; and Thomas, Robert, 3,820,088.

Agency of Industrial Science & Technology: *See—*
Shimizu, Hiroshi; Sakakibara, Shunsaku; and Ishigura, Ryoichi, 3,819,349.
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Agfa-Gevaert Aktiengesellschaft: *See—*
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Agusto, Robert G.: *See—*
Boehme, Werner R.; and Agusto, Robert G., 3,819,648.

Ahmed, Abul Abbas Mesbahuddin, to AMP Incorporated. Method of assembling a glow discharge readout device. 3,818,556, Cl. 29-25.140.

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Aimi, Mitsuo; and Seigenji, Kiyoshi, to Minolta Camera Kabushiki Kaisha. Translator for measuring amount of color correction for color. 3,819,275, Cl. 356-175.000.

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Finnemore, Harlan E., 3,818,978.

Aitken, Ian Donald; Gayler, Ronald; Grover, John Roger; and Spencer, Raymond Anthony Philip, to United Kingdom Atomic Energy Authority. Membrane assemlbies for reverse asmosis apparatus. 3,819,056, Cl. 210-321.000.

Aito, Yuzo; Fujii, Takeshi; Saiki, Noritsugu; Shuji, Irie; and Yasujuni, Nakatsuji, to Teijin Limited. Process for preparation of unsaturated polyester. 3,819,760, Cl. 260-861.000.

Aizawa, Hiroshi; and Ogiso, Mitsutoshi, to Canon Kabushiki Kaisha. Camera driving control device. 3,820,141, Cl. 354-171.000.

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Akane, Junta; Saito, Takanori; and Yasuda, Tetsuo, to Showa Denko Kabushiki Kaisha. Impact resistant resinous compositions containing acrylonitrile-chlorinated polyethylene-styrene resin or methyl methacrylate-chlorinated polyethylene-styrene resin and an lastomer. 3,819,763, Cl. 260-876.00r.

Akaoka, Teruhisa: *See—*
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Akiyama, Susumu, to Nippon Electric Company, Limited. Hybrid feedback amplifier. 3,820,036, Cl. 330-28.000.

Akiyama, Yoshiyuki: *See—*
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Aktiebolaget Carl Munters: *See—*
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Aktiebolaget Electrolux: *See—*
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Aktiengesellschaft Adolph Saurer: *See—*
Maron, Edmund, 3,818,941.

Aktiengesellschaft Jungbunzlauer Spiritus- und Chemische Fabrik: *See—*
Kominek, Georg, 3,819,696.

Akzo N.V.: *See—*
Roskott, Lodewiji; and Groenendaal, Arnoldus Adrianus Maria, 3,819,496.
Roskott, Lodewijk; and Groenendaal, Arnoldus Adrianus Maria, 3,819,495.

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Albrecht, Gunnar, to Helly-Hansen A/S. Protective suit against poisonous substances. 3,818,507, Cl. 2-2.000.

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Johansson, Bjorn-Olow, 3,818,805.

Allard, Frank L. Electronic metronome. 3,818,693, Cl. 58-130.00e.

Allecci, Donald E.: *See—*
Sinnott, David J.; and Allecci, Donald E., 3,820,127.

Allen Group, Inc., The: *See—*
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Finke, Arthur A., 3,819,136.

Allen, James W. Magnetic separator. 3,819,515, Cl. 210-42.000.

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Stemple, James M.; and Allen, Paul E., 3,818,596.

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Allied Chemical Corporation: *See—*
Graves, Charles A.; and Sopchak, Peter, 3,819,805.
Josephsen, Roy C.; and Weir, Clifford L., 3,819,313.
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Elders, Gerald W.; Schneider, Thomas E.; and Alongi, John R., 3,819,101.

Alps Electric Co., Ltd.: *See—*
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Altares, Timothy, Jr.: *See—*
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Alton, Ahdor Hermyrt: *See—*
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Arpajian, Vasken Frank, to Penwalt Corporation. Cold runner injection mold for thermosetting resins. 3,819,312, Cl. 425-242.00r.

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Paton, Boris Evgenievich; Theddvar, Boris Izrailevich; Latash, Jury Vadimovich; Chekotilo, Leonty Vasilievich; Emelyanenko, July Georgievich; Us, Vasily Ivandvich; Baglai, Vitaly Mikhailovich; Martyn, Viktor Mikhailovich; Artamonov, Viktor Leonidovich; Bonarenko, Oleg Petrovich; Boiko, Georgy Alexandrovich; Tsikulenko, Anatoly Konstantinovich; Ivon, Vasily Vladimirovich; and Pavlov, Leonid Viktorovich, 3,818,973.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Haratake, Yoshiharu, 3,820,126.
Nomura, Katsuhiko; Uno, Naoyuki; Sakazaki, Tadazumi; Watanabe, Koichiro; and Urano, Fumio, 3,820,139.

Asahi Kohaku Kogyo Kabushiki Kaisha: *See—*
Miyakawa, Seinan, 3,820,125.

Asayama, Tadashi: *See—*
Kuwayama, Hiroji; Kajita, Hiroyuki; Asayama, Tadashi; and Nishio, Nobuyuki, 3,819,327.

Asberg, Sture Lennart; and Lo Nardo, Domenico, to SKF Industrial Trading and Development Co. Bearing unit for a rotating drum. 3,819,243, Cl. 308-191.000.

Ashizawa, Masayoshi: *See—*
Fushida, Yoshio; Suzuki, Kazuo; Kasahara, Kakaaki; Okawa, Kazuyoshi; and Ashizawa, Masayoshi, 3,819,025.

Asick, John Carl: *See—*
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Asmus, Carl, Jr., to Clayton Manufacturing Company. Automatic load control system for hydraulic rotary power absorbers. 3,818,754, Cl. 73-134.000.

Asselborn, Peter; Cramer, Werner; and Schmitz, Guenter, to Felten & Guilleaume Kabelwerke Aktiengesellschaft. Apparatus for withdrawing strand-like material in longitudinal direction. 3,819,073, Cl. 214-338.000.

Assmus, Friedrich; Flaig, Hans; Dietrich, Dieter; and Hartner, Leo. Electric signaling device for alarm clocks. 3,820,105, Cl. 340-309.400.

Astley, Peter James: *See—*
Wilton, Raymond Charles; and Astley, Peter James, 3,820,134.

Atago, Takeshi: *See—*
Hosho, Yukio; and Atago, Takeshi, 3,818,881.

Atco Rubber Products, Inc.: *See—*
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Athlon Corporation, The: *See—*
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Condo, Albert C.; and Neubauer, Joseph J. N., 3,818,711.
Perkins, Thomas K., 3,818,992.
Rosenthal, Rudolph, 3,819,798.

Atlas Copco Aktiebolag: *See—*
Soderman, Claes Erik, 3,819,115.

Auer, John H., Jr.; Marsh, Donald B.; and DiPaola, John J., to General Signal Corporation. Multi-computer automatic vehicle control system. 3,819,932, Cl. 246-1.00r.

Aurium Research Corporation: *See—*
Katz, Michel, 3,819,366.

Automatic Incinerator Correction Corporation: *See—*
Hirsch, Jack, 3,818,683.

Automatic Radio Mfg. Co., Inc.: *See—*
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Automobiles Peugeot: *See—*
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Avon Products, Inc.: *See—*
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Hattenbrun, David L., 3,819,525.

Axelsson, Nils Rune; and Wretemark, Sven Gunnar, to Telefonaktiebolaget L M Ericsson. Wedge-type holding device. 3,819,287, Cl. 403-211.000.

Aya, Masahiro; Kishino, Shigeo; Kudamatsu, Akio; Fukazawa, Nobuo; Kume, Toyohiko; and Shiokawa, Kozo, to Bayer Aktiengesellschaft. Amidothionophosphonic acid esters. 3,819,754, Cl. 260-954.000.

Ayai, Yoshikazu: *See—*
Baba, Yoshiki; and Ayai, Yoshikazu, 3,818,610.

Ayer, George Edward, to Bunker Ramo Corporation. Method and apparatus for connecting multi-conductor cables. 3,820,056, Cl. 339-22.000.

Ayers, Myron T., to General Tire & Rubber Company, The. Method for single stage curing of integrated dual chambered safety tires. 3,819,791, Cl. 264-94.000.

Baba, Yoshiki; and Ayai, Yoshikazu, to Kabushiki Kaisha International Library. Study aid. 3,818,610, Cl. 35-9.00c.

Babcock & Wilcox Company, The: *See—*
Cauley, William J.; and Maykuth, Joseph F., 3,818,733.
Pocock, Frederick J.; and Leedy, William G., 3,819,476.
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Watanabe, Tsuneo; and Iwai, Akinori, 3,818,873.

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Baccellieri, Michael P.: *See—*
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Bachman, John A.: *See—*
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Badger Company, Inc., The: *See—*
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Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
Beutel, Peter; Koenig, Karl-Heinz; Adolphi, Heinrich; Rittig, Falk; and Urbach, Hans, 3,819,756.
Pommer, Horst; Mueller, Herbert; and Overwien, Hermann, 3,819,713.
Schreiner, Siegfried; Lukas, Siegmar; and Poschmann, Franz, 3,819,807.

Baechtold, Werner, to International Business Machines Corporation. Electro-acoustic transducer housing adapted for telephonic PCM communication systems. 3,819,879, Cl. 179-179.000.

Baesch, Viktor, to Ludwig-Ofag-Indugas Industrieanlagen GmbH. Method of making an electro magnetic-sheet stack. 3,819,427, Cl. 148-122.000.

Baglai, Vitaly Mikhailovich: *See—*
Paton, Boris Evgenievich; Theddvar, Boris Izrailevich; Latash, Jury Vadimovich; Chekotilo, Leonty Vasilievich; Emelyanenko, July Georgievich; Us, Vasily Ivandvich; Baglai, Vitaly Mikhailovich; Martyn, Viktor Mikhailovich; Artamonov, Viktor Leonidovich; Bonarenko, Oleg Petrovich; Boiko, Georgy Alexandrovich; Tsikulenko, Anatoly Konstantinovich; Ivon, Vasily Vladimirovich; and Pavlov, Leonid Viktorovich, 3,818,973.

Bagprint Ltd.: *See—*
Kleinhaut, Samuel; and Thiel, Herbert Willy, 3,818,811.

Bailey, John M.; and Zook, Donald G., to Caterpillar Tractor Company. Connecting rod manufacturing. 3,818,577, Cl. 29-413.000.

Bailey, Robert E.: *See—*
Murchison, Craig B.; Bailey, Robert E.; and Diesen, Ronald W., 3,819,516.

Baird, Bennett Ray, to Du Pont de Nemours, E. I., and Company. Aromatic polyamides stabilized with nickelous carbonate. 3,819,569, Cl. 260-45.7sn.

Bakelite Xylonite Limited: *See—*
Webster, Joseph George; and Tuck, William Henry, 3,819,796.

Baker Drapery Corporation: *See—*
Baker, George H., Sr., 3,818,543.

Baker, George H., Sr., to Baker Drapery Corporation. Drapery support. 3,818,543, Cl. 16-87.40r.

Baker, Philip G.; Cook, Gerald H.; and Downey, Rogers B., to Polaroid Corporation. System for rupturing pod containing processing fluid for photographic material. 3,820,149, Cl. 354-317.000.

Baker, Robert W., to Flexible Metal Hose Manufacturing Company. Electrical cable connecting device. 3,819,849, Cl. 174-86.000.

Balch, Ralph H.; Watson, George A.; and Coates, Herbert W., to Celanese Corporation. Stitched nonwoven webs. 3,819,469, Cl. 161-154.000.

Baldassarri, Agostino; and Ferro, Walter, to Minnesota Mining and Manufacturing Company. Azodicarbonamidine salts as silver halide fog inhibitors. 3,819,380, Cl. 96-76.00r.

Baldwin, Richard H.; Burney, Donald E.; Towle, Philip H.; and Micklewright, Donald G., to Standard Oil Company. Trimellitic acid anhydride recovery from liquid phase oxidation of pseudocumene. 3,819,659, Cl. 260-346.400.

Baldwin, Richard W.: *See—*
Funk, Paul M.; Legg, Billy J.; and Baldwin, Richard W., 3,819,585.

Baldwin, William S.; and Keeney, Kenneth W., to General Mills Chemicals, Inc. Methylation of tocopherols. 3,819,657, Cl. 260-345.500.

Ball Corporation: *See—*
Scholes, Addison B.; and Kozlowski, Joseph J., 3,819,404.

Ball, John Robin, to Post Office, The. Digital signal regenerators. 3,820,034, Cl. 328-164.000.

Ballinger, Forrest H.; Heggestad, Robert E.; and Olmsted, Leland W., to Harmon Industries, Inc. Presence detector having automatic digital tuning. 3,820,100, Cl. 340-258.00c.

Ballman, Gray C. Time responsive starting switches. 3,819,994, Cl. 318-221.00e.

Ballman, Gray C. Time responsive starting switches. 3,819,995, Cl. 318-221.00e.

Baliweber, Duane C. Frame anchor hook device. 3,818,750, Cl. 72-476.000.

Balzers Patent- und Beteiligungs-Aktiengesellschaft: *See—*
Wagner, Rudolf, 3,818,982.

Banike, Ronald A., to Integral Process Systems, Inc. Refrigerating apparatus. 3,818,719, Cl. 62-374.000.

Banks, Roger W.: *See—*
Butler, Lawrence W.; and Banks, Roger W., 3,819,258.

Barabas, Eugene S., to GAF Corporation. Alkyl acrylate-crotonic acid-poly vinyl lactam graft copolymers. 3,819,559, Cl. 260-29.6wb.

Bard, C. R., Inc.: *See—*
Bleecker, John A., 3,818,903.

Barham, Stanley H.: *See—*
Cooper, Glenn Adair; and Barham, Stanley H., 3,818,601.

Barie, Walter P., Jr.; Franke, Norman W.; and Paviak, Stanley C., to Gulf Research & Development Company. Uniform mixtures of quaternary ammonium salt isomers. 3,819,656, Cl. 260-343.700.

Barlow, Sidney D.: *See—*
Andrews, Francis W.; Sussman, Philip S.; and Barlow, Sidney D., 3,819,285.

Barnard, Mark Cary Sedgwick; and Hughes, John Oliver Philip, to British Leyland Truck and Bus Division Limited. Gas turbine vehicle equipped with pneumatic brakes. 3,819,233, Cl. 303-1.000.

Barrera, Carlos M.; Stark, Clarence C.; and Stark, Clarence C., to Ford Motor Company. Signal generating process for use in engine control. 3,818,877, Cl. 123-32.0ea.

Barron, Edward R.: *See—*
Barron, Edward R.; and Tanenholtz, Stanley D. (said Taneholtz assor. to said), 3,818,756.

Barron, Edward R.; and Tanenholtz, Stanley D., said Taneholtz assor. to said Barron, Edward R. Load profile analyzer in the attached specification. 3,818,756, Cl. 73-172.000.

Barron, Mark B.: *See—*
Butler, Walter J.; Barron, Mark B.; and Kurz, Bruno, 3,819,954.

Barstow, Frederick C.; and Uhrich, Carole J., to Polaroid Corporation. Dye diffusion transfer film containing alkali-dissociable inorganic salts. 3,819,381, Cl. 96-77.000.

Barteck, Werner W.: *See—*
Rehkopf, John W.; and Barteck, Werner W., 3,819,138.

Barth, Hans-Dieter: *See—*
Brand, Erich; and Barth, Hans-Dieter, 3,819,333.

Barthel, Hans: *See—*
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Barton, George C.: *See—*
Garner, Derek H.; Bosworth, George H.; and Barton, George C., 3,818,526.

BASF Aktiengesellschaft: *See—*
Beck, Fritz; Sabelus, Guenther; Fischer, Roman; and Haufe, Juergen, 3,819,548.
Stastny, Fritz; Trieschmann, Hans-Georg; and Gaeth, Rudolf, 3,819,543.

Baso, Loris. Tensioning lever buckle, particularly for plastic ski boots. 3,818,547, Cl. 24-70.0sk.

Bateman, J. W. Casing expanding mandrel. 3,818,734, Cl. 72-75.000.

Bates, Emile Bernard. Method of treating a fibric web with a liquid. 3,819,325, Cl. 8-151.000.

Bates, James John, to National Research Development Corporation. Electrical brushes. 3,818,588, Cl. 29-630.00e.

Bates Manufacturing Company, The: *See—*
Beger, Richard E., 3,818,622.

Batorewicz, Wadim. Polymeric phosphite polyols. 3,819,771, Cl. 260-921.000.

Battigelli, Jean, to Saint-Gobain. Production of fibers from thermoplastic materials, particularly glass fibers. 3,819,345, Cl. 65-6.000.

Baturov, Vladimir Ivanovich; Prilutsky, Yakov Khaimovich; Shiborin, Viktor Ivanovich; and Shkoropad, Dmitry Evseevich. Method for suspension separation and apparatus for accomplishing same. 3,819,110, Cl. 233-17.000.

Bauer Engineering, Inc.: *See—*
Matschke, Donald E.; Tenny, Alfred M.; and Gregersen, Jack K., 3,819,799.

Bauer, Hugh B.: *See—*
Obler, Henry D.; and Bauer, Hugh B., 3,818,814.

Bauknecht, Gunter; Hadam, Wilhelm; and Ploppa, Jurgen, to Stroll, H., and Company. Data storage means for electrical control systems particularly for knitting machines. 3,820,082, Cl. 340-172.500.

Baum, Charles S., to Textron, Inc. High density carbide stud. 3,818,966, Cl. 152-210.000.

Bauman, Joseph F.; and Elson, Arthur M., to Acme-Hamilton Manufacturing Corporation. Apparatus for handling waste material, refuse and the like. 3,819,069, Cl. 214-41.000.

Baumgartener, Kenneth A. Reusable blank cartridge and reloading assemblies. 3,818,834, Cl. 102-41.000.

Baxter Laboratories, Inc.: *See—*
St. John, Peter A.; and Goldsmith, Herbert, 3,819,212.

Baychem Corporation, mesne: *See—*
Epstein, Peter F.; Caffrey, Joseph R.; and Yu, Pyung Kyung, 3,819,357.

Bayer Aktiengesellschaft: *See—*
Aya, Masahiro; Kishino, Shigeo; Kudamatsu, Akio; Fukazawa, Nobuo; Kume, Toyohiko; and Shiokawa, Kozo, 3,819,754.
Buchner, Werner; Noll, Walter; and Bressel, Bernd, 3,819,744.
Draber, Wilfried; Buchel, Karl-Heinz; Hammann, Ingeborg; and Frohberger, Paul-Ernst, 3,819,703.
Kuhle, Engelber; Klauke, Erich; Hammann, Ingeborg; Hamburger, Brigitte; and Frohberger, Paul-Ernst, 3,819,684.
Lorenz, Walter; Boshagen, Horst; Hammann, Ingeborg; and Behrenz, Wolfgang, 3,819,644.
Riebel, Hans-Jochem; Brokmeier, Dieter; and Hammann, Ingeborg, 3,819,753.
Rudolph, Hans; Dhein, Rolf; De Cleur, Eckhard; and Kreuder, Hans-Joachim, 3,819,586.
Rudolph, Karl-Heinz; Buchner, Werner; and Noll, Walter, 3,819,674.
Seng, Florin; Ley, Kurt; and Georg, Karl, 3,819,616.
Tarnow, Horst; Sasse, Klaus; Homeyer, Bernhard; and Wolfgang, Behrenz, 3,819,755.
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Bayer, Karl-Heinz: *See—*
Tappeiner, Hermann; Waldmann, Hermann; and Bayer, Karl-Heinz, 3,820,003.

Bazell, Seymour: *See—*
Goldberg, Edward M.; Bazell, Seymour; and Ostensen, Ralph G., 3,818,511.

Beach, David E., to Eastman Kodak Company. Camera. 3,820,142, Cl. 354-206.000.

Beasley, William L.; and German, John P., to Research Corporation, mesne. Method and apparatus for locating electromagnetic radiation in the VHF and UHF range from direct or alternating current electric power lines. 3,820,018, Cl. 324-52.000.

Beaufrere, Albert H. Regenerative air-cooled gas turbine engine. 3,818,696, Cl. 60-39.5lh.

Beaulieu, Richard G., to Leisure Group, Inc., The. Work-holding chuck and cartridge-case trimmer employing same. 3,818,563, Cl. 29-1.320.

Beck, Francis Xavier, Jr.; and Kinslow, William Edward, Jr., to RCA Corporation. Merchandise handling and identifying system. 3,819,012, Cl. 186-1.00a.

Beck, Fritz; Sabelus, Guenther; Fischer, Roman; and Haufe, Juergen, to BASF Aktiengesellschaft. Electrocoating composition containing an acid binder present as the salt of an arylamine, alkynyl amine, quaternary ammonium hydroxide or. 3,819,548, Cl. 260-1800r.

Beck, Heinz-Jurgen: *See—*
Schacher, Willi; and Beck, Heinz-Jurgen, 3,819,021.

Beck, Henry N.; Ledbetter, Harvey D.; and Schmitt, John A., to Dow Chemical Corporation, The. Nucleation of normally crystalline vinylidene chloride polymers. 3,819,595, Cl. 260-87.700.

Beckman Instruments, Inc.: *See—*
Diamond, Allen M., 3,819,981.

Beckmann, Georg; and Gilli, Paul Viktor, to Waagner-Biro Aktiengesellschaft. Steam power plants. 3,818,698, Cl. 60-94.00a.

Becton, Dickinson and Company: *See—*
Parent, Ronald A.; and Andrews, John H. P., Jr., 3,819,505.

Bedenbaugh, Angela O.: *See—*
Adkins, James D.; Bedenbaugh, Angela O.; Bedenbaugh, John H.; and Bergin, Willie A., 3,819,704.

Bedenbaugh, John H.: *See—*
Adkins, James D.; Bedenbaugh, Angela O.; Bedenbaugh, John H.; and Bergin, Willie A., 3,819,704.

Bedi, Ram D., to Eaton Corporation. Self-locking fastener. 3,818,525, Cl. 10-27.00r.

Bedocs, Michael F.: *See—*
Anderson, Fred N.; Bedocs, Michael F.; and Long, Eric L., 3,819,882.

Beever, Albert, III. Automatic sheet lining machine. 3,819,448, Cl. 156-355.000.

Beffa, Fabio: *See—*
Brueniholz, Jean; and Beffa, Fabio, 3,819,690.

Beffel, Raymond W.: *See—*
Klema, Kenneth G., 3,819,046.

Beger, Richard E., to Bates Manufacturing Company, The. Key controlled card selector with means to prevent simultaneous operation of adjacent keys. 3,818,622, Cl. 40-104.010.

Behne, Stephen G., to Chemetron Corporation. Rail grinding method. 3,818,650, Cl. 51-326.000.

Behrenz, Wolfgang: *See—*
Lorenz, Walter; Boshagen, Horst; Hammann, Ingeborg; and Behrenz, Wolfgang, 3,819,644.
Zumach, Gerhard; Kuhle, Engelbert; Behrenz, Wolfgang; and Hammann, Ingeborg, 3,819,682.

Bell & Howell Company: *See—*
Way, John L., 3,820,083.

Bell Canada-Northern Electric Company, Limited: *See—*
Lama, Ugis Guntis, 3,820,089.

Bell, James Alexander E.; Opratko, Vaclav; and Clarkson, Daniel Kelly, to International Nickel Company, Inc., The. Preferential sulfiding of nickel and cobalt oxides. 3,819,801, Cl. 423-138.000.

Bell, John M. Method for practicing shorthand. 3,818,608, Cl. 35-8.00a.

Bell, Malcolm R., to Sterling Drug Inc. 1,2-Diphenyl-1,2,3,4-tetrahydroquinolines. 3,819,637, Cl. 260-288.00r.

Bell Telephone Laboratories, Incorporated: *See—*
Argyle, John F.; Medowski, Glenn O.; Ports, David W.; and Sutch, Richard D. (said Argyle assor. to), 3,819,785.
Blahut, Donald Edgar; Friedman, Stanley Joel; and Nash, Donald Henry, 3,819,877.
Bobeck, Andrew Henry; Ciak, Frank John; and Strauss, Walter, 3,820,092.
Borsuk, Michael Howard; Browne, Paul Nolan; and Wright, Arden Bernard, 3,819,859.
Braune, David Paul, 3,819,989.
Candy, James Charles, 3,820,111.
Chilton, John Michael; and Jaffe, Donald, 3,819,976.
Feldman, Martin; and King, Michael Charles, 3,819,265.
Hamrick, Harold Escar, 3,819,872.
Hawley, George Thomas, 3,819,866.
Kibler, Lynden Underwood, 3,819,250.
Mathews, Max Vernon, 3,819,861.
Mueller, Kurt Hugo, 3,820,042.

Belleau, Bernard R.: *See—*
Pachter, Irwin J.; Belleau, Bernard R.; and Monkovic, Ivo, 3,819,635.

Bellina, Russell F. 2-(Hydrocarbylthio)-2-(hydroxyimino)acetamide, S-oxides and derivatives. 3,819,700, Cl. 260-561.00s.

Bellows, John G.: *See—*

Bellows, John G.; and Borough, Howard C. (said Borough assor. to said), 3,819,256.

Bellows, John G.; and Borough, Howard C., said Borough assor. to said Bellows, John G. Apparatus for refracting the eye. 3,819,256, Cl. 351-6.000.

Beloit Corporation: *See*—
Wentworth, William P., 3,819,292.

Bemberg, J. P., Aktiengesellschaft: *See*—
Pirot, Ernst, 3,819,769.

Bend Millwork Company: *See*—
Pozzi, Arthur A., 3,818,960.

Bender, Charles E., to Spectroderm Inc. Apparatus and method for treatment of skin disorders. 3,818,914, Cl. 128-396.000.

Bender, Harry: *See*—
Pitt, Harold M.; and Bender, Harry, 3,819,731.

Benderly, Asaf A.; and Hartter, Donald R. Thermal reaction battery. 3,819,415, Cl. 136-83.00t.

Bendix Corporation, The: *See*—
Carrico, John P., 3,819,941.
Foxworthy, Eugene R.; Blatter, Albert; Gamber, William N.; Presley, Rex W.; and Verge, Kenneth W., 3,819,135.
Gaiser, Robert F., 3,818,706.
Hall, Roger D.; and Johnson, Robert P., 3,820,117.
Hall, Roger D., 3,820,118.
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Lehde, John W., Jr.; and Vora, Prabodh M., 3,819,195.
Peczkowski, Joseph L., 3,818,921.
Platt, Walter A., 3,819,999.
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Bennett, James S.: *See*—
Casson, Harold V.; Bennett, James S.; and Loftfield, Richard E., 3,819,503.

Bennett, John E., to Diamond Shamrock Corporation. Method of maintaining cathodes of an electrolytic cell free of deposits. 3,819,504, Cl. 204-289.000.

Benoit, Roland A.; and Duprey, Richard H., to Interroyal Corporation. Pivot joint for beds. 3,818,518, Cl. 5-200.00c.

Benson, Robert A., to Submarine Engineering Associates, Inc. Floating barrier. 3,818,708, Cl. 61-1.00f.

Benson, William Evan, to Deere & Company. Burnishing tool. 3,818,559, Cl. 29-90.000.

Ber, Esther: *See*—
Dvolaitzky, Frajda; Cognacq, Jean-Claude; and Ber, Esther, 3,819,723.

Bergen, Gary R.: *See*—
Hart, Le Roy; Salonia, Thomas R.; and Bergen, Gary R., 3,819,214.

Berger, Frank J.; and Megerle, George H., to Wella Corporation. Aluminum oxide containing hair treating composition. 3,819,827, Cl. 424-80.000.

Bergh, Arndt B.; Forbes, Bert E.; Hamilton, James O., III; and Mixsell, Joseph C., Jr. Bus oriented, modular, multiprocessing computer. 3,820,079, Cl. 340-172.500.

Bergin, Willie A.: *See*—
Adkins, James D.; Bedenbaugh, Angela O.; Bedenbaugh, John H.; and Bergin, Willie A., 3,819,704.

Bergman, Peter J.: *See*—
Crozier, David F.; and Bergman, Peter J., 3,819,272.

Bergmeyer, Hans Ulrich: *See*—
Bernt, Erich; Bergmeyer, Hans Ulrich; and Grassl, Marianne, 3,819,487.

Beriger, Ernst, to Ciba-Geigy Corporation. O-Acrylic acid ester-O-alkyl-(thio)-phosphonic amides. 3,819,752, Cl. 260-941.000.

Berinde, Vasile; Million, Adolf; Greavu, Nicolae; and Million, Carol, to Institutul de Cercetari Tehnologice Pentru Constructii de Masini. Welding process using granular or powder filler delivered on open-channel strip. 3,819,901, Cl. 219-76.000.

Berkey Photo, Inc.: *See*—
Nesson, Israel; Faris, Edwin E.; and Spezial, Ronald, 3,820,146.

Berleyoung, Walter J.; and Lewis, Jay L., to Robertshaw Controls Company. Thermometer construction and method of making the same. 3,818,763, Cl. 73-363.700.

Bernt, Erich; Bergmeyer, Hans Ulrich; and Grassl, Marianne, to Boehring Mannheim GmbH. Stable NADA Compositions. 3,819,487, Cl. 195-99.000.

Berry, Brian S.; and Pritchet, Walter C., to International Business Machines Corporation. Use of magnetically variable young's modulus of elasticity and method for control of frequency of electromechanical oscillator. 3,820,040, Cl. 331-156.000.

Berry, Jim S., to Procter & Gamble Company, The. Stabilized aqueous enzyme compositions. 3,819,528, Cl. 252-153.000.

Berry, Milton E., to Southwire Company. Cast bar draft angle. 3,818,972, Cl. 164-87.000.

Berry, Robert F.; and Blackwell, Henry W. Well pressure sealing cup reinforcing structure and method of manufacture. 3,819,192, Cl. 277-212.00c.

Bertaux, Andre, to Hydraulique B.G. Electrohydraulic remote-control devices of slide distributors. 3,818,800, Cl. 91-411.000.

Berthelot, Guy; and Perez, Jean Jacques, to Commissiariat A l'Energie Atomique. Photometric analyzer having two wavelengths for the determination of elements in a solution. 3,819,277, Cl. 356-204.000.

Berthet, Andre, to Cebal. Metal container with rolled rim. 3,818,850, Cl. 113-120.0aa.

Bertin, Daniel; Perronnet, Jacques; and Teche, Andre, to Roussel-UCLAF. 2-Phenyl-1,1-dihalo-alkane-2-ols. 3,819,722, Cl. 260-618.00d.

Bertram, James L.; Whiteside, Ross C., Jr.; and Franke, Preston H., Jr., to Dow Chemical Company, The. Hydrogen sulfide-modified epoxy resins and flexible laminates therefrom. 3,819,747, Cl. 260-830.0tw.

Bessho, Motoaki: *See*—
Inai, Yuichi; Okazaki, Kanzo; Uchiyama, Mikio; Shimada, Katsutoshi; Kagei, Kengo; and Bessho, Motoaki, 3,819,705.

Bettge, Hans: *See*—
Peche, Gerhard; and Bettge, Hans, 3,819,897.

Bettinger, Eugen Julius; Bohret, Harmut Heiner; and Schanzer, Gunther, to Bodenseewerk Geratetechnik GmbH. Device for the flight guidance from a wireless guide beam. 3,819,914, Cl. 235-150.220.

Beug, Hartmut; and Gerisch, Gunther, to Max-Planck Gesellschaft zur Forderung der Wissenschafter e.V. Gottingen. Method and apparatus for measuring agglutination of cells in a carrier liquid. 3,819,271, Cl. 356-39.000.

Beutel, Peter; Koenig, Karl-Heinz; Adolphi, Heinrich; Rittig, Falk; and Urbach, Hans, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Dithiophosphoric esters. 3,819,756, Cl. 260-956.000.

Bhuta, Pravin G.; Aprahamian, Robert; and Jocaby, Jerold L., to TRW Inc. Acousto-optical underwater imaging system. 3,820,062, Cl. 340-3.00r.

Bianchi, Turreno, to S.A.I.P. (S.p.A.). Hydraulic tightening-up device for very high stresses. 3,819,286, Cl. 403-31.000.

Bibaut, Gilbert Abel. Endless track. 3,819,240, Cl. 305-54.000.

Bickmore, John T., to Xerox Corporation. Image developing apparatus. 3,818,864, Cl. 118-637.000.

Bierenfeld, Herbert Henry, to Western Electric Company, Incorporated. Strand threading device. 3,819,099, Cl. 226-91.000.

Biethan, Uwe: *See*—
Dorffel, Jorg; and Biethan, Uwe, 3,819,757.

Bigenwald, John J.: *See*—
Borostyan, Stephen; and Bigenwald, John J., 3,819,175.

Binder, John Frank, to General Electric Company. Adhesively bonded commutator. 3,819,967, Cl. 310-236.000.

Bino, Charles F., to Burlington Industries, Inc. Fugitive-staining process for textile fibers. 3,819,324, Cl. 8-164.000.

Bird Island, Inc.: *See*—
Wildhaber, Ernest, 3,818,796.

Bird, Stanford W., to Plastronics Corporation. Carrying container. 3,819,080, Cl. 220-17.000.

Birrell, Stewart Hector, to Reflex Corporation of Canada Limited. Aerosol valve cup and safety collar. 3,819,090, Cl. 222-182.000.

Bishop, John W. H.: *See*—
Ploeger, Walter, Jr.; and Bishop, John W. H., 3,819,026.

Biteryakov, Viktor Vasilievich: *See*—
Kozorezov, Konstanti Isaakovich; Semchenko, Vitaly Vasilievich; Biteryakov, Viktor Vasilievich; Mikhailu, Georgy Ivanovich; and Skugorova, Ninel Fedorovna, 3,819,890.

Bittner, Charles W.; and Rexon, George F., to Precision Parts Company, Inc. Fluid dispensing nipple construction. 3,818,945, Cl. 138-89.000.

Bjork, Albion P., to Polaroid Corporation. Photoflash power supply. 3,819,983, Cl. 315-238.000.

Blackshear, David M.: *See*—
Pearl, David L.; and Blackshear, David M., 3,819,856.

Blackwell, Henry W.: *See*—
Berry, Robert F.; and Blackwell, Henry W., 3,819,192.

Blahut, Donald Edgar; Friedman, Stanley Joel; and Nash, Donald Henry, to Bell Telephone Laboratories, Incorporated. Centralized network for a telephone station system. 3,819,877, Cl. 179-170.00r.

Blaimberger, Robert: *See*—
Imme, Helmut; Blaimberger, Robert; and Schulz, Gunter, 3,819,169.

Blanchard, Robert R., to Dow Chemical Company, The. Readily processable essentially rigid vinyl chloride polymer compositions. 3,819,554, Cl. 260-28.50d.

Blaskowski, Henry John, to Combustion Engineering, Inc. Method of operating a combined gasification-steam generating plant. 3,818,869, Cl. 122-5.000.

Blaszczynski, Zdzislaw M. Rotary internal combustion engine. 3,818,886, Cl. 123-8.410.

Blatter, Albert: *See*—
Foxworthy, Eugene R.; Blatter, Albert; Gamber, William N.; Presley, Rex W.; and Verge, Kenneth W., 3,819,135.

Bleecker, John A., to Bard, C. R., Inc. Self-inflating catheter with deflating means and reservoir. 3,818,903, Cl. 128-349.0bv.

Bleiche AG: *See*—
Stritzko, Vilem, 3,819,097.

Bloch, Michael; and Koebner, Adolph, to Rewo Chemische Fabrik G.m.b.H. Process for preparing detergent compositions. 3,819,539, Cl. 252-547.000.

Block Engineering, Inc.: *See*—
Hirschfeld, Tomas, 3,819,270.

Bloom, Milton W., to Donlee Manufacturing Industries Limited. Child's safety seat. 3,819,230, Cl. 297-250.000.

Blue, Donald E., to Caterpillar Tractor Company. Tooth forming machine. 3,818,736, Cl. 72-88.000.

Bluestone, Henry; and Osgood, Edmond R., to Diamond Shamrock Corporation. Process for preparing 2,5-hexanedione. 3,819,714, Cl. 260-595.000.

Blum, Alvin S., to Products International Incorporated. Identification system. 3,820,072, Cl. 340-149.00a.

Bobb, John S. Stephen: *See—*
Weldes, Helmut H.; Bobb, John S. Stephen; and Derolf, M. Robert, 3,819,392.

Bobeck, Andrew Henry; Ciak, Frank John; and Strauss, Walter, to Bell Telephone Laboratories, Incorporated. Magnetic domain detector arrangement. 3,820,092, Cl. 340-174.0eb.

Bocian, Harvey; and Brent, Allan L., to Labco Products, Inc. Article support in oven. 3,819,322, Cl. 432-5.000.

Bockemuehl, Johannes: *See—*
Bockemuehl-Simon, Johannes Juergen, 3,819,125.

Bockemuehl-Simon, Johannes Juergen, to Bockemuehl, Johannes. Reel for strip-shaped articles. 3,819,125, Cl. 242-77.100.

Bockenstette, Kenneth R., to Vanguard Industries, Inc. Container cooperable with a like container in an empty nesting relation and plurality of articles conataining stacking relations. 3,819,044, Cl. 206-507.000.

Bodenseewerk Geratetechnik GmbH: *See—*
Bettinger, Eugen Julius; Bohret, Harmut Heiner; and Schanzer, Gunther, 3,819,914.

Bodenseewerk Parkin-Elmer & Co. GmbH: *See—*
Braun, Klaus Joachim; Manthey, Kurt; Rogasch, Klaus-Peter; and Tamm, Rolf Gunter Arnold, 3,819,279.

Bodnar, Janos: *See—*
Puklics, Maria; Guczoghy, Lajos; Matolcsy, Gyorgy; and Bodnar, Janos, 3,819,609.

Boehland, Robert R., Jr., to Feather Hill Industries, Inc. Bird house. 3,818,868, Cl. 119-23.000.

Boehme, Werner R.; and Agusto, Robert G., to Dawe's Laboratories, Inc. Production of phthalimide. 3,819,648, Cl. 260-326.00r.

Boehring Mannheim GmbH: *See—*
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Boeing Company, The: *See—*
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Bohn, Georg: *See—*
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Bohret, Harmut Heiner: *See—*
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Boiko, Georgy Alexandrovich: *See—*
Paton, Boris Evgenievich; Theddvar, Boris Izrailevich; Latash, Jury Vadimovich; Chekotilo, Leonty Vasilievich; Emelyanenko, July Georgievich; Us, Vasily Ivandvich; Baglai, Vitaly Mikhailovich; Martyn, Viktor Mikhailovich; Artamonov, Viktor Leonidovich; Bonarenko, Oleg Petrovich; Boiko, Georgy Alexandrovich; Tsikulenko, Anatoly Konstantinovich; Ivon, Vasily Vladimirovich; and Pavlov, Leonid Viktorovich, 3,818,973.

Bolex International S.A.: *See—*
Thevenaz, Jean; Etter, Walter; and Thevenaz, Louis, 3,819,129.

Bolick, Fred C., Jr., to Lanier Electronic Laboratory, Inc. Remaining tape sensing apparatus. 3,820,101, Cl. 340-259.000.

Bolling, Henry E.: *See—*
Keeney, William W.; and Bolling, Henry E., 3,818,888.

Bond, Herbert M., to Buckler-Mears Company. Heated, vacuum-pressure press. 3,818,823, Cl. 100-93.00p.

Bondarenko, Oleg Petrovich: *See—*
Paton, Boris Evgenievich; Theddvar, Boris Izrailevich; Latash, Jury Vadimovich; Chekotilo, Leonty Vasilievich; Emelyanenko, July Georgievich; Us, Vasily Ivandvich; Baglai, Vitaly Mikhailovich; Martyn, Viktor Mikhailovich; Artamonov, Viktor Leonidovich; Bonarenko, Oleg Petrovich; Boiko, Georgy Alexandrovich; Tsikulenko, Anatoly Konstantinovich; Ivon, Vasily Vladimirovich; and Pavlov, Leonid Viktorovich, 3,818,973.

Bonduris, Angelo T., to Colgate-Palmolive Company. Pressurized dispensers. 3,819,092, Cl. 222-389.000.

Bongenaar, Hendrik: *See—*
Eisses, Reinhart Charles Willem; Bongenaar, Hendrik; and Doreleijers, Theodorus Cornelis Gerardus, 3,818,557.

Boni, Richard R.: *See—*
Jawelak, Melbourne G.; and Boni, Richard R., 3,819,893.

Bonnes, Hedley Allan; and Ravenscroft, Edward. Means for protecting an end of an tubular member. 3,818,946, Cl. 138-96.00r.

Boone, David E.: *See—*
Fotis, Peter; and Boone, David E., 3,819,599.

Booth, Charles Lawrence, to Du Pont de Nemours, E. I., and Company. Circuit package with fugitive shorting bar. 3,820,152, Cl. 357-74.000.

Borchard, Heinz; Kasch, Robert; and Rybka, Bruno, to Ted-Bildplatten Aktiengesellschaft Aeg-Telefunken-Teldec. Apparatus for stamping information carriers from a plastic foil. 3,819,315, Cl. 425-383.000.

Borg-Warner Corporation: *See—*
Grandia, William M., 3,818,983.
Heathwaite, Hewart H., 3,819,002.
Silberschlag, Russell E., 3,819,015.
Venema, Harry J., 3,818,899.

Borkowski, Walter L.; Van Venrooy, John J.; and Seitzer, Walther H., to Sun Research and Development Co., mesne. Chlorination of hydrocarbons. 3,819,732, Cl. 260-659.00a.

Borner, Manfred; Maslowski, Stefan; and Krumpholz, Oskar, to Licentia Patent-Verwaltungs-G.m.b.H. Optical coupling arrangement. 3,819,249, Cl. 350-96.0wg.

Borostyan, Stephen; and Bigenwald, John J., to Xerox Corporation. Vacuum stripping roll with stationary pickup slots. 3,819,175, Cl. 271-174.000.

Borough, Howard C.: *See—*
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Borroughs Tool & Equipment Corporation: *See—*
Okamuro, James A., 3,818,738.

Borsanyi, Alexander S., to American Hospital Supply Corporation. Dampening unit for pulsatile pump. 3,818,934, Cl. 137-568.000.

Borsuk, Michael Howard; Browne, Paul Nolan; and Wright, Arden Bernard, to Bell Telephone Laboratories, Incorporated. Horizontal SYNC detector and video clamp circuit. 3,819,859, Cl. 178-69.5tv.

Bosch, Robert, Fernsehanlagen GmbH: *See—*
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Bosch, Robert, G.m.b.H.: *See—*
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Boshagen, Horst: *See—*
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Boshold, Raymond F.: *See—*
Pollak, Kurt; and Boshold, Raymond F., 3,818,745.

Bosse, Frank, to Windmoller & Holscher. Apparatus for making handles for carrier bags. 3,818,810, Cl. 93-8.0wa.

Bosshard, Hans; Diamantoglou, Michael; Koelliker, Hans Peter; and Karlen, Urs, to Ciba-Geigy AG. Anthraquinone dyestuffs which are sparingly soluble in water. 3,819,665, Cl. 260-376.000.

Boston, Denis R., to Olin Corporation. Adjustable scarfing tool. 3,819,898, Cl. 219-8.500.

Bosworth, George H.: *See—*
Garner, Derek H.; Bosworth, George H.; and Barton, George C., 3,818,526.

Boucherie, G. B., naamloze vennootschap, Firma: *See—*
Boucherie, Gerard Benoni, 3,818,534.

Boucherie, Gerard Benoni, to Boucherie, G. B., naamloze vennootschap, Firma. Brush. 3,818,534, Cl. 15-195.000.

Boudard, Jean; and Marcellin, Louis, to Wendel-Sidelor and Societe d'Aerodynamique et de Thermodynamique. Method and apparatus for recovering the energy of expansion of wet dusty gases under pressure. 3,818,707, Cl. 60-685.000.

Bouillon, Claude; Dufaure, Pierre; and Rosenbaum, Georges, to Societe anonyme dite: L'Oreal. Dioxaluminium and dioxaluminane compounds and their preparation. 3,819,671, Cl. 260-448.0ad.

Bourgeois, Ivan Marie Gaston Prudent; Daniels, Henricus Petrus Cornelis; and Verlet, Ronny Julius Camiel Cornelius. Arrangement for generating ultrasonic oscillations. 3,819,961, Cl. 310-8.100.

Bourgeois, Norbert Paul, to Etudes et Bonneterie S.A. Data programming device, particularly for control of knitting machines. 3,818,724, Cl. 66-50.00r.

Bouteille, Daniel. Pneumatic memory relay. 3,818,943, Cl. 137-625.660.

Bouthors, Pierre; Dera, Alain; and Lefeuvre, Andre, to Regie Nationale des Usines Renault and Automobiles Peugeot. Automatic safety harness control system. 3,819,196, Cl. 280-150.0sb.

Bove, Fred, to Importec Technical Improvement S.A. Composition for cleaning adhering hardened concrete and for stripping concrete and plaster. 3,819,523, Cl. 252-89.000.

Bowler, Lauren L.; and Johnston, Laird E., to General Motors Corporation. Anti-lock brake system. 3,819,235, Cl. 303-21.00f.

Bowman, Ronald R., to Motorola, Inc. Fabrication of semiconductor devices. 3,819,433, Cl. 156-13.000.

Bozzato, Giuliano; Pesaro, Mario; Schudel, Peter; Hug-Inderbitzin, Marianne; and Erickson, Robert Edward, to Givaudan Corporation. Novel noreremophilane derivatives. 3,819,711, Cl. 260-586.00r.

BP Chemicals Limited: *See—*
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Braden, William D.; and Marshall, Richard P., to Goodyear Tire & Rubber Company, The. Method for manufacturing V belts. 3,818,576, Cl. 29-414.000.

Brakebill, Harold G.: *See—*
Puster, Louis M.; Lewis, Jay L.; and Brakebill, Harold G., 3,819,113.

Brand, Erich; and Barth, Hans-Dieter, to Chemiebau Dr. A. Zieren GmbH & Co. Apparatus for the separation of organic acid anhydrides. 3,819,333, Cl. 23-273.00f.

Bratland, Knut: *See—*
Karker, Stig Rutger; and Bratland, Knut, 3,818,935.

Bratton, Francis H. Eye treatment application devices. 3,818,909, Cl. 128-232.000.

Braukmann, Heinz Werner. Reduced pressure backflow preventer valve. 3,818,929, Cl. 137-218.000.

Braun, Klaus Joachim; Manthey, Kurt; Rogasch, Klaus-Peter; and Tamm, Rolf Gunter Arnold, to Bodenseewerk Parkin-Elmer & Co. GmbH. Sample atomizing device having a radiation absorbing protective jacket for flameless atomic abrorption spectroscopy. 3,819,279 Cl. 356-244.000.

Braune, David Paul, to Bell Telephone Laboratories, Incorporated. Printed wiring board assembly. 3,819,989, Cl. 317-101.00f.

Bray, Jules: *See—*
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Bredt, Elmer S. Animal sanitary device. 3,819,220, Cl. 294-19.00r.

Brenner, Stanley S.: *See—*
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Brent, Allan L.: *See—*
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**Bressel, Bernd:** *See—*
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**Bridgestone Tire Company Limited:** *See—*
Nakamura, Kihei; Yamazaki, Harumichi; and Kondo, Yoshikazu, 3,819,167.
Onishi, Akira; Irako, Koichi; Iseda, Yutaka; Hayakawa, Yoshihiro; Kawagoe, Takahiro; and Miyamoto, Shoji, 3,819,590.
**Bridwell, Harold C., to Diamond, Christensen, Products Company.** Apparatus and method for situ sharpening of bore hole bits. 3,818,997, Cl. 175-57.000.
**Briggs & Stratton Corporation:** *See—*
Harkness, Joseph R.; Santi, John D.; and Lechtenberg, Leo J., 3,818,586.
**Brindell, Gordon Dwight:** *See—*
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**Bristol-Myers Company:** *See—*
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**Brite Star Manufacturing Company, Inc.:** *See—*
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**British Aircraft Corporation Limited:** *See—*
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**British Leyland (Austin-Morris) Limited:** *See—*
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**British Leyland Truck and Bus Division Limited:** *See—*
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**British Petroleum Company Limited:** *See—*
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**British Petroleum Company Limited, The:** *See—*
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**British Steel Corporation:** *See—*
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**Britton, James S.:** *See—*
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**Brixy, Heinz; and Gartner, Klaus-Jurgen, to Kernforschungsanlage Julich GmbH.** System for measuring temperatures. 3,818,761, Cl. 73-359.000.
**Brock, Alan James; and Fulton, Douglas William.** Drip irrigation. 3,819,118, Cl. 239-276.000.
**Broekema, Gerhard Willem; and Hooghordel, Rijk, to U.S. Philips Corporation.** Circuit arrangement for bridging a potential level, including a chopper. 3,819,978, Cl. 315-26.000.
**Brokmeier, Dieter:** *See—*
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**Bron, Alphonse:** *See—*
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**Brossi, Arnold; Focella, Antonino; and Teitel, Sidney, to Hoffmann-La Roche Inc.** Process for the preparation of alkyl substituted resorcinols. 3,819,725, Cl. 260-625.000.
**Broughton, Barbara Joyce; Large, Bryan John; Marshall, Stuart Malcolm; Pain, David Lord; and Wooldridge, Kenneth Robert Harry, to May & Baker Limited.** Azapurinones. 3,819,631, Cl. 260-256.40f.
**Brouillette, Joseph W.; and Pruski, Edward M., to United States of America, Army.** Means for controlling impedance characteristics of acoustic delay line transducers. 3,820,043, Cl. 333-70.00r.
**Brown & Williamson Tobacco Corporation:** *See—*
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**Brown, Alvin E., to Saratoga Systems, Inc.** Dual path ultrasonic fluid flow metering system and method. 3,818,757, Cl. 73-194.00a.
**Brown, Gerald V., to United States of America, National Aeronautics and Space Administration.** Magnetocaloric pump. 3,819,299, Cl. 417-52.000.
**Brown, John Colin; and Keogh, Patrick Joseph, to Ilford Limited.** Bisselenosemicarbazides. 3,819,698, Cl. 260-558.00h.
**Brown, Raymond S.:** *See—*
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**Brown, Wade; and Farber, Joseph, to Ciba-Geigy Corporation.** Dialkylphenolthiazines and phenolic antioxidants as stabilizing compositions. 3,819,574, Cl. 260-45.8sn.
**Browne, Paul Nolan:** *See—*
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**Bruce, Daniel:** *See—*
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**Bruenisholz, Jean; and Beffa, Fabio, to Ciba-Geigy AG.** Acid nitro dyestuffs, their manufacture and use. 3,819,690, Cl. 260-510.000.
**Bruenner, Rolf S., to Aerojet-General Corporation.** Wetting agents for non-aqueous dispersions. 3,819,561, Cl. 260-32.60a.
**Brun, Jean-Pierre; Bulvestre, Gerard; Juillou, Michel; Thirion, Pierre; and Pautrat, Rene.** Process for separating hydrocarbons. 3,819,742, Cl. 260-681.50r.
**Brushenko, Anatoli, to United States of America, Health, Education and Welfare.** Alignment techniques for fiber bundles. 3,819,442, Cl. 156-180.000.
**Bryan Donkin Company, Limited, The:** *See—*
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**Bryan, Graham W.:** *See—*
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**Bubniak, William C.; Huellmantel, Louis W.; and Mitchell, Harry R.** Mass flow air meter. 3,818,933, Cl. 137-503.000.
**Buchel, Karl-Heinz:** *See—*
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**Buchner, Werner; Noll, Walter; and Bressel, Bernd, to Bayer Aktiengesellschaft.** Polydiorganosiloxane-polycarbonate block copolymers. 3,819,744, Cl. 260-824.00r.
**Buckler-Mears Company:** *See—*
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**Buerhler Corporation, The:** *See—*
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**Buess, Kenneth Benning:** *See—*
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**Buhs, Marion W.; Cousino, Reynold J.; and DiFrank, Frank J., to Owens-Illinois, Inc.** Two-cell-type carton fillers. 3,818,812, Cl. 93-37.00r.
**Bulk Liner Corporation:** *See—*
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**Bull, Dale L.:** *See—*
Miller, Gerald K.; Bull, Dale L.; and Rautiola, Norman A., 3,819,891.
**Bulloch, Carl Gordon, Jr.** Method of making foam cushions. 3,818,560, Cl. 29-91.100.
**Bulvestre, Gerard:** *See—*
Brun, Jean-Pierre; Bulvestre, Gerard; Juillou, Michel; Thirion, Pierre; and Pautrat, Rene, 3,819,742.
**Bungardt, Karl; Lehnert,Gunter; and Meinharde, Helmut W., to Deutsche Edelstahlwerke Aktiengesellschaft.** Protective diffusion layer on nickel and/or cabalt-based alloys. 3,819,338, Cl. 29-194.000.
**Bunker Ramo Corporation:** *See—*
Ayer, George Edward, 3,820,056.
**Burdeska, Kurt, to Ciba-Geigy AG.** Naphthoylene-benzimidazole and naphthaloperinone. 3,819,632, Cl. 260-282.000.
**Burgarella, John P.; Carcia, Peter P.; and Kee, Richard C., to Polaroid Corporation.** Flash photographic control system. 3,820,128, Cl. 354-32.000.
**Burgess Vibrocrafters, Inc.:** *See—*
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**Buriks, Rudolf S.:** *See—*
Fauke, Allen R.; and Buriks, Rudolf S., 3,819,589.
**Burkhart, Rolf:** *See—*
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**Burleigh, Malcolm B., to Minnesota Mining and Manufacturing Company.** Polycyclic dyes. 3,819,664, Cl. 260-356.000.
**Burlington Industries, Inc.:** *See—*
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**Burney, Donald E.:** *See—*
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**Burr, Alan Carleton, to Howe Furniture Corporation.** Treatle type table with folding legs. 3,818,844; Cl. 108-132.000.
**Burrell, Theodore Alexander, to Oakville Wood Specialties Limited.** Manufacture of fruit baskets and the like. 3,818,572, Cl. 29-208.00b.
**Burroughs Wellcome & Co., (U.S.A.) Inc.:** *See—*
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**Burroughs Wellcome Co.:** *See—*
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**Burt, Glenn R.; Condo, Albert C.; Eliason, Kay E.; and McCormack, John J., to Atlantic Richfield Company.** Frozen embankments. 3,818,712, Cl. 61-50.000.
**Buseth, Richard A., to Aeroquip Corporation.** Petroleum transfer self-sealing coupling. 3,818,939, Cl. 137-614.060.
**Bush Boake Allen Limited:** *See—*
Smith, Ross Alexander; and Lambrou, Andreas, 3,819,838.
**Bush, Charles J., to New York City Transit Authority, The.** Railroad track assembly. 3,819,114, Cl. 238-121.000.
**Bushaw, Wayne; Halliday, Adam T.; Mukavitz, David R.; and Loan, Richard L., to Copper Range Company.** Copper converting process with prolonged blowing period. 3,819,362, Cl. 75-76.000.
**Bussey, James R.:** *See—*
Keith, Billy M.; Bussey, James R.; Cannon, Sidney E.; Patton, James C.; Fisher, Perry G.; Caldwell, Joseph H.; and Crocker, Ralph H., Jr., 3,819,837.
**Butler, Lawrence W.:** *See—*
Butler, Lawrence W.; and Banks, Roger W., 3,819,258.
**Butler, Lawrence W.; and Banks, Roger W., to Scripps-Clemans, Inc. and Butler, Lawrence W.** Film framing and transport system. 3,819,258, Cl. 352-163.000.
**Butler, Walter J.:** *See—*
Puckette, Charles McD.; and Butler, Walter J., 3,819,953.
**Butler, Walter J.; Barron, Mark B.; and Kurz, Bruno, to General Electric Company.** Signal level shift compensation in charge-transfer delay line circuits. 3,819,954, Cl. 307-221.00d.
**Butts, Ernest O.; and Hall, John S., to Hambro Structural Systems Limited.** Formwork for concrete walls. 3,819,143, Cl. 249-33.000.

Butts, William O., to Micromation Systems, Inc. Title and index generator for a microfiche. 3,820,076, Cl. 340-172.500.

Butzelaar, Petrus Floris: *See*—
Hoogeveen, Leonardus Petrus Johannes; and Butzelaar, Petrus Floris, 3,819,499.

Byrne, John F.: *See*—
Luebbe, Ray H., Jr.; and Byrne, John F., 3,819,368.

Caffrey, Joseph R.: *See*—
Epstein, Peter F.; Caffrey, Joseph R.; and Yu, Pyung Kyung, 3,819,357.

Cahill, Paul J.; and Kurasiewicz, Adam S., to Standard Oil Company. Alkenylsuccinic anhydride preparation. 3,819,660, Cl. 260-346.80r.

Calais, Bernard; and Vidal, Luis, to Ste. Calais, Bernard S.a.r.L. Hermetically sealing closure device having a sliding door. 3,818,636, Cl. 49-224.000.

Calame, Jean Pierre: *See*—
Siddall, John B.; and Calame, Jean Pierre, 3,819,667.

Caldarella, Riccardo: *See*—
Lamartina, Alfonso; Cicognani, Enrico; Caldarella, Riccardo; and Antonini, Athos, 3,819,869.

Calderwood, Gene C.: *See*—
North, Howard C.; Calderwood, Gene C.; and Williamson, Charles W., 3,819,790.

Caldwell, Edward N., to Robertshaw Controls Company. Valve construction and system utilizing the same. 3,818,981, Cl. 165-35.000.

Caldwell, Joseph H.: *See*—
Keith, Billy M.; Bussey, James R.; Cannon, Sidney E.; Patton, James C.; Fisher, Perry G.; Caldwell, Joseph H.; and Crocker, Ralph H., Jr., 3,819,837.

Callies, Gerald A.; Irland, Frank W.; Retzloff, Russell C.; and Zellers, James T., to Libbey-Owens-Ford Company. Temperature regulation of molten glass. 3,819,347, Cl. 65-29.000.

Calottan AG: *See*—
Schuter, Wilhelm, 3,818,522.

Campagnie des Freins et Signoux Westinghouse: *See*—
Adde, Joseph, 3,819,004.

Campbell, David Neil, to Hymatic Engineering Company, Limited, The. Cryogenic cooling apparatus. 3,818,720, Cl. 62-514.000.

Campbell, John B.; and Thurn, Robert Dean. Branched-chain hydrocarbon elastomers. 3,819,591, Cl. 260-80.780.

Campbell, Robert Henry; Rader, Charles Phillip; and Wright, Robert Lee, to Monsanto Company. Treating metal clad steel wire for application of organic adhesive. 3,819,399, Cl. 117-49.000.

Candor, James T.; and Tassone, Joseph V. Package construction for baseball tee, bat and ball. 3,819,038, Cl. 206-223.000.

Candy, James Charles, to Bell Telephone Laboratories, Incorporated. Analog-to-digital converter. 3,820,111, Cl. 340-347.0ad.

Cannon, Sidney E.: *See*—
Keith, Billy M.; Bussey, James R.; Cannon, Sidney E.; Patton, James C.; Fisher, Perry G.; Caldwell, Joseph H.; and Crocker, Ralph H., Jr., 3,819,837.

Canon Kabushiki Kaisha: *See*—
Aizawa, Hiroshi; and Ogiso, Mitsutoshi, 3,820,141.
Hosoe, Kazuya; Matsumoto, Seiichi; and Mochizuki, Noritaka, 3,820,129.
Komiya, Takao; Ihara, Takashi; Matsuo, Takehiko; Tosaka, Umi; Negishi, Hirokazu; and Ohhara, Karsunobu, 3,819,370.
Taguchi, Tatsuya; and Iura, Yukio, 3,820,124.

Canrad Precision Industries, Inc.: *See*—
Newman, Henry C., 3,819,929.

Cantor, Stephen E.; Brindell, Gordon Dwight; and Quint, Robert John, to Uniroyal, Inc. Method for stabilizing glycidol. 3,819,662, Cl. 260-348.00r.

Canup, Robert E., to Texaco Inc. High-frequency continuous-wave ignition system. 3,818,885, Cl. 123-148.00e.

Caputo, James P.: *See*—
Weber, Fred A.; Caputo, James P.; Eddy, John W.; Harrington, Phil R.; O'Toole, Gerald; Puccini, Sergio E.; and Adamski, Diane L., 3,819,865.

Carcia, Peter P.: *See*—
Burgarella, John P.; Carcia, Peter P.; and Kee, Richard C., 3,820,128.

Care, Inc.: *See*—
Winfield, Armand G.; and Winfield, Barbara L., 3,819,466.

Caretta, Renato, to Industrie Pirelli S.p.A. Stitching apparatus for tire building machines and relative stitching method. 3,819,449, Cl. 156-413.000.

Cargagna, Paul D., to Du Pont de Nemours, E. I., and Company. Coating solution of citric acid, malonic acid, or the acid ester of citric of malonic acid and a selected polyhydroxy aliphatic acid; and a. 3,819,562, Cl. 260-33.40r.

Carli, Renzo, to Carrozzeria Pininfarina S.p.A. Motor vehicle with sunshine roof. 3,819,227, Cl. 296-137.00d.

Carlisle, Gilbert A.; and Frank, Charles E., to General Motors Corporation. Overcenter latch mechanism for a tilting truck cab. 3,819,225, Cl. 296-35.00r.

Carlo Erba S.p.A.: *See*—
Ambrogi, Vittorio; Logemann, Willy; Parenti, Marcantonio; and Tommasini, Raffaele, 3,819,633.

Carlsson, Eric Ake Ragnar; Dahlsjo, Olof Gustav Robert; Karlsson, Goran Roland; and Pettersson, Kent Morgan, to Telefonaktiebolaget LM Ericsson. Double reflector antenna with polarization rotating main reflector. 3,820,116, Cl. 343-756.000.

Carlyle, Lance J. Fluid metering device. 3,818,924, Cl. 137-99.000.

Carmien, Joseph Allen, to Nupla Corporation. Adapter for fiberglass tool ahndles and other fiberglass connections. 3,819,288, Cl. 403-247.000.

Carpenter, John J. Water hammer arrester. 3,818,931, Cl. 137-374.000.

Carpenter, Steve H.: *See*—
Howell, William G.; Carpenter, Steve H.; and Otto, Henry E., 3,819,103.

Carpigiani, Poerio. Continuous ice cream machine. 3,818,716, Cl. 62-178.000.

Carreras Limited: *See*—
Sylvester, Herbert A., 3,818,809.

Carrico, John P., to Bendix Corporation, The. Mass dependent ion microscope having an array of small mass filters. 3,819,941, Cl. 250-281.000.

Carrier Corporation: *See*—
Carroll, Alexander A., 3,819,289.
Honnold, Fred V.; and Martin, William C., Jr., 3,819,294.
Liberman, Harvey W., 3,819,071.

Carroll, Alexander A., to Carrier Corporation. Structure for detachable securing a member concentrically to a high speed shaft. 3,819,289, Cl. 403-259.000.

Carroll, Paul E.; and Harris, Ralph A., to Texas Instruments, Incorporated. Digital DC offset removal method for data systems. 3,819,864, Cl. 179-15.0bl.

Carrozzeria Pininfarina S.p.A.: *See*—
Carli, Renzo, 3,819,227.

Carson, Don D., to Universal Oil Products Company. Fluid mixing apparatus. 3,818,938, Cl. 137-604.000.

Carsten, Paul W., to CVC Company. Hydropneumatic capacitor. 3,818,928, Cl. 137-211.500.

Carter, Charles N.; and Sage, Burton H., to Corning Glass Works. Detection of eosinophil cells on a blood smeared slide. 3,819,913, Cl. 235-92.0pc.

Carter, John R.: *See*—
Pine, Buddie J.; and Carter, John R., 3,819,878.

Carter, William E., Sr., to Thermo-Kinetics, Inc. Conditioning unit with modular construction. 3,818,655, Cl. 52-79.000.

Casanova, Manuel Portavella; and Santaeulalia, Antonio Casacuberta, to Colomer Munmany, S.A. Processing drum for treating hides. 3,818,730, Cl. 69-30.000.

Casella, Michael D. Rocking chair or cradle with rocking mechanism. 3,818,517, Cl. 5-105.000.

Casey, William D.; Frank, William R.; and Simonte, Antonino, to General Motors Corporation. Vehicle body construction. 3,819,224, Cl. 296-28.00r.

Casse, Robert; Robin, Henri; and Vallas, Gilbert, to Electronique Marcel Dassault. Tracking and homing radar with digital register for the storage of distance information. 3,820,119, Cl. 343-7.300.

Casson, Harold V.; Bennett, James S.; and Loftfield, Richard E., 50% to Diamond Shamrock Corporation and 50% to Huron Chemicals Limited. Electrolytic cell for the production of oxyhalogens. 3,819,503, Cl. 204-268.000.

Castenfors, Hugo: *See*—
Hollender, Anders K. Y., 3,819,091.

Castle & Cooke, Inc.: *See*—
Vadas, Leslie, 3,818,788.

Castoe, John Herman. Independent suspension system for a motor vehicle having camber and caster adjustments. 3,819,202, Cl. 280-96.20b.

Catena, Michael J.: *See*—
Coffey, Charles A.; and Catena, Michael J., 3,819,119.

Caterpillar Tractor Co.: *See*—
Muller, Thomas P.; and Popdan Gary L., 3,819,018.

Caterpillar Tractor Company: *See*—
Bailey, John M.; and Zook, Donald G., 3,818,577.
Blue, Donald E., 3,818,736.
Glassey, Stephen F., 3,818,883.

Cato, Carl P., to Dacam Corporation. Loading station structure for tray forming machine. 3,819,057, Cl. 211-50.000.

Cauley, William J.; and Maykuth, Joseph F., to Babcock & Wilcox Company, The. Piercing process. 3,818,733, Cl. 72-41.000.

Cavazos, Antonio M.; and Kelley, Donald W., to Thuron Industries, Inc. Fire retardant compositions. 3,819,517, Cl. 252-8.100.

Cebal: *See*—
Berthet, Andre, 3,818,850.

Cederholm, Carl E., to Hasbro Industries, Inc. Toy article and neck connector therefor. 3,818,631, Cl. 46-161.000.

Celanese Corporation: *See*—
Balch, Ralph H.; Watson, George A.; and Coates, Herbert W., 3,819,469.
Roberts, John D.; Ellenberg, John D.; and Keith, Charles H., 3,819,435.
Soehngen, John W., 3,819,452.
St. Pierre, Richard; and Halpern, Melvin A., 3,818,863.

Centinela Hospital Association, d/b/a Centinela Valley Community Hospital: *See*—
Hopper, Paul J.; Kleinpeter, Jack D.; and Milano, Dominic C., 3,818,516.

Cermak, Eduard. Brake and emergency brake installation for vehicle trailers. 3,819,238, Cl. 303-47.000.

Ceskoslovenska Akademie Ved: *See*—
Wichterle, Otto; and Kresa, Zdenek, 3,818,894.

Chamberlain, Timothy, to Day Star Corporation. Freezer bag holder. 3,818,956, Cl. 141-316.000.

Chambersburg Engineering Company: *See*—
Hague, Wilmer W., 3,818,799.

Champion International Corporation: *See*—
Powell, Mabrin P.; and Nauman, Mark R., 3,819,398.
Vincent, David N.; and Chang, Cheng Hsiung, 3,819,396.

Champion, Michael John; and Donnelly, Robert William, to ITT industries, Inc. Electrical connector. 3,820,053, Cl. 339-17.00f.

Chan, Pierre Edouard, to Montecatini Edison S.p.A. Catalytic alloy of silver and tin for the production of ethylene oxide from ethylene. 3,819,537, Cl. 252-476.000.

Chance, A. B., Company: *See*—
Reimbold, James J., Jr., 3,819,063.

Chandler, Susan. Pill tray. 3,819,064, Cl. 214-1.00c.

Chang, Cheng Hsiung: *See*—
Vincent, David N.; and Chang, Cheng Hsiung, 3,819,396.

Chang, Joseph J.; and Sumilas, John W., to International Business Machines Corporation. Two phase charge-coupled semiconductor device. 3,819,959, Cl. 307-304.000.

Chang, Robert W. H.: *See*—
Taylor, Charles W.; and Chang, Robert W. H., 3,819,568.

Charbonnages de France: *See*—
Marcellini, Robert Ph. A., 3,818,606.

Charles, Harry R.; and Miles, Donald L., to Chemfil Miles Chemical & Filter Co., Inc. Final rinse step in phosphating of metals. 3,819,423, Cl. 148-6.15r.

Charles, Joseph T. Method and apparatus for storing buried telephone distribution wires. 3,819,847, Cl. 174-37.000.

Charniga, Joseph. Siding mounting strip. 3,818,668, Cl. 52-547.000.

Chatterji, Arun K.; Marianne, Custazzo; Demosthemes, Kiriazides K.; Russell, John J., Jr.; and Serio, John P., said Russell assor. to Xerox Corporation. Imaging system. 3,819,367, Cl. 96-1.0sd.

Chaudhari, Praveen; and Zarowin, Charles B., to International Business Machines Corporation. Three dimensional memory. 3,820,087, Cl. 340-173.0lm.

Chausse, Burnette P.: *See*—
Konrad, Charles E.; and Chausse, Burnette P., 3,820,109.

Chekotilo, Leonty Vasilievich: *See*—
Paton, Boris Evgenievich; Theddvar, Boris Izrailevich; Latash, Jury Vadimovich; Chekotilo, Leonty Vasilievich; Emelyanenko, July Georgievich; Us, Vasily Ivandvich; Baglai, Vitaly Mikhailovich; Martyn, Viktor Mikhailovich; Artamonov, Viktor Leonidovich; Bonarenko, Oleg Petrovich; Boiko, Georgy Alexandrovich; Tsikulenko, Anatoly Konstantinovich; Ivon, Vasily Vladimirovich; and Pavlov, Leonid Viktorovich, 3,818,973.

Chemagro Corporation: *See*—
Poje, Albert J.; and Newallis, Peter E., 3,819,358.

Chemetron Corporation: *See*—
Behne, Stephen G., 3,818,650.

Chemfil Miles Chemical & Filter Co., Inc.: *See*—
Charles, Harry R.; and Miles, Donald L., 3,819,423.

Chemiebau Dr. A. Zieren GmbH & Co.: *See*—
Brand, Erich; and Barth, Hans-Dieter, 3,819,333.

Chemische Werke Huels Aktiengesellschaft: *See*—
Dorffel, Jorg; and Biethan, Uwe, 3,819,757.

Cherry Electrical Products Corporation: *See*—
Anderson, Fred N.; Bedocs, Michael F.; and Long, Eric L., 3,819,882.

Chevallier, Pierre, to Etabissements Genoud & Cie, Societe Anonyme. Automatic cigarette lighter. 3,819,320, Cl. 431-254.000.

Chevron Research Company: *See*—
Kobzina, John W., 3,819,626.
Kurkov, Victor P.; and Sharman, Samuel H., 3,819,691.
Marquis, David M., 3,818,680.
Sharman, Samuel H.; House, Ralph; and Anderson, Glen W., 3,819,519.
Sims, Marc J., 3,819,521.

Chilton, John Michael; and Jaffe, Donald, to Bell Telephone Laboratories, Incorporated. Ta-Al alloy attenuator for traveling wave tubes and method of making same. 3,819,976, Cl. 315-3.500.

Chinoin Gyogyszer-es Vegyeszeti Termekek Gyara Rt.: *See*—
Puklics, Maria; Guczoghy, Lajos; Matolcsy, Gyorgy; and Bodnar, Janos, 3,819,609.

Chlumecky, Nicholas, to Commercial Shearing & Stamping Company. Tunnel liners. 3,818,710, Cl. 61-45.00r.

Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, to Hoffmann-La Roche Inc. Benzodioxane derivatives. 3,819,655, Cl. 260-340.300.

Chowning, Edward A.: *See*—
Adams, Albert; and Chowning, Edward A., 3,819,360.

Christensen, Burton G.; Pollak, Peter I.; and Wendler, Norman L., to Merck & Co., Inc. Alkyl-or arylsulfonyloxy, alkanoyloxy substituted propylphosphonic acid lower alkyl esters. 3,819,676, Cl. 260-456.00r.

Christiaens, A., Societe Anonyme: *See*—
Delarge, Jacques E.; Thunus, Leopold Nicolas Joseph Victor; Lapiere, Charles-Leon Albert; and Georges, Andre Henri Eugene, 3,819,639.

Christopher, Charles A., Jr.; and Satter, Abdus, to Texaco Inc. Method for preferentially producing petroleum from reservoirs containing oil and water. 3,818,989, Cl. 166-274.000.

Chrysler Corporation: *See*—
Dawson, Gary D.; and Harris, Robert S., 3,818,880.

Chupka, Francis L., Jr.: *See*—
Russell, Philip W.; Simons, Charles W.; and Chupka, Francis L., Jr., 3,819,473.

Ciak, Frank John: *See*—
Bobeck, Andrew Henry; Ciak, Frank John; and Strauss, Walter, 3,820,092.

Ciba-Geigy AG: *See*—
Bosshard, Hans; Diamantoglou, Michael; Koelliker, Hans Peter; and Karlen, Urs, 3,819,665.
Bruenisholz, Jean; and Beffa, Fabio, 3,819,690.
Burdeska, Kurt, 3,819,632.
Jaeger, Horst, 3,819,668.
Siegrist, Adolf Emil, 3,819,615.

Ciba-Geigy Corporation: *See*—
Beriger, Ernst, 3,819,752.
Brown, Wade; and Farber, Joseph, 3,819,574.
Dexter, Martin; and Knell, Martin, 3,819,572.
Kirchmayr, Rudolf, 3,819,645.
Kleiner, Eduard K.; and Falk, Robert A., 3,819,666.
Nikles, Erwin, 3,819,678.

Cicognani, Enrico: *See*—
Lamartina, Alfonso; Cicognani, Enrico; Caldarella, Riccardo; and Antonini, Athos, 3,819,869.

Ciga-Geigy AG: *See*—
Jaccard, Roland; Hostettler, Paul; and Siegrist, Rudolf, 3,819,332.

Cincinnati Butchers Supply Company, The, mesne: *See*—
Swilley, Wilson H., 3,818,836.

Cincinnati Milacron Inc.: *See*—
Evans, Wendell Irving, 3,818,648.
Wise, Robert G.; and Wiebe, Harold D., 3,820,024.

Cities Service Company: *See*—
Green, Joseph, 3,819,575.

Clampitt, Bert H.; Harwell, Kenneth E.; and Jones, Joseph W., Jr., to Gulf Research & Development Company. Oil spill recovery. 3,819,514, Cl. 210-40.000.

Clarisse, Christian, to Electronique Marcel Dassault. System for determining the presence of a given frequency in an incoming signal. 3,820,021, Cl. 324-78.00q.

Clark, Bernard, to Thackray, Chas. F., Limited. Femoral prosthesis with removable protective sheath. 3,818,514, Cl. 3-1.000.

Clark Equipment Company: *See*—
Anderson, Leonard M., 3,818,659.
Upham, Robert Warren, 3,818,795.

Clark, John R., to Industries for the Blind, Incorporated. Shipping and display arrangement for brooms. 3,819,034, Cl. 206-45.140.

Clarke, Edwin E.; and Florig, Albert J., said Clarke assor. to Bulk Liner Corporation and Florig assor. to Florig Equipment Company, Inc. Bulk material handling system. 3,819,070, Cl. 214-49.000.

Clarke, George E.; and Krumke, Warren E., to United States of America, Navy. Self-locking holdback cleat. 3,818,958, Cl. 244-115.000.

Clarkson, Daniel Kelly: *See*—
Bell, James Alexander E.; Opratko, Vaclav; and Clarkson, Daniel Kelly, 3,819,801.

Clayton Manufacturing Company: *See*—
Asmus, Carl, Jr., 3,818,754.

Clayton, William Harold, Jr.; and Schuetzenduebel, Wolfram Gerhard, to Combustion Engineering, Inc. Economizer bypass for increased furnace wall protection. 3,818,872, Cl. 122-406.003.

Cleary, James, to Phillips Petroleum Company. Polyolefin rendered dye reseptive with copped polyamide, polyamide or polyester. 3,819,758, Cl. 260-857.00l.

Clemens, Theodorus Albertus: *See*—
Gellekink, Bernard; and Clemens, Theodorus Albertus, 3,820,113.

Cleveland Partition Corporation: *See*—
Cunningham, Donald F., 3,819,041.

Clewes, Antony Brasher; and Tuckwood, Denis William, to TRW Inc. Electrical sockets. 3,820,054, Cl. 339-17.0cf.

Cliche, Carl E.: *See*—
Grubb, Willard T.; and Cliche, Carl E., 3,819,416.

Clippard, William L., III, to Clippard-Instrument Laboratory, Inc. Annular port construction for spool valve. 3,819,152, Cl. 251-367.000.

Clippard-Instrument Laboratory, Inc.: *See*—
Clippard, William L., III, 3,819,152.

Coale, Thomas E.; Gunn, Sidney W.; Merrigan, Frank; and Tompkins, Donald M., to St. Regis Paper Company. Method of forming an engraved plate. 3,818,832, Cl. 101-401.100.

Coates, Herbert W.: *See*—
Balch, Ralph H.; Watson, George A.; and Coates, Herbert W., 3,819,469.

Cobb, Earnest G.; and Reasnor, Larry J. Kamp-top. 3,819,223, Cl. 296-26.000.

Coe, Roger Frank, to Lucas, Joseph (Industries) Limited. Method of producing a pair of silicon. 3,819,787, Cl. 264-65.000.

Coffey, Charles A.; and Catena, Michael J., to Harris Paint Company. Sprayer for decorating surfaces. 3,819,119, Cl. 239-337.000.

Cognacq, Jean-Claude: *See*—
Dvolaitzky, Frajda; Cognacq, Jean-Claude; and Ber, Esther, 3,819,723.

Cognitronics Corporation: *See*—
Shepard, David H., 3,820,067.

Cole, George S.; Ritzenthaler, Richard L.; and Arnold, Don C. Diaphragm valve for liquids. 3,819,148, Cl. 251-252.000.

Coleman Company, Inc., The: *See*—
Sykora, Hans Werner, 3,819,226.

Colgate-Palmolive Company: *See*—
Bonduris, Angelo T., 3,819,092.

Schubert, Warren Robert; and Marshall, James Richard, 3,819,524.
Zmoda, Barney J.; and Brown, Raymond S., 3,819,522.

Colomer Munmany, S.A.: *See—*
Casanova, Manuel Portavella; and Santaeulalia, Antonio Casacuberta, 3,818,730.

Combs, Robert L.: *See—*
Weaver, James C.; Gray, Theodore F., Jr.; and Combs, Robert L., 3,819,759.

Combustion Engineering, Inc.: *See—*
Blaskowski, Henry John, 3,818,869.
Clayton, William Harold, Jr.; and Schuetzenduebel, Wolfram Gerhard, 3,818,872.
Leshem, Adam, 3,818,786.

Combustion Power Co., Inc.: *See—*
Reese, Richard G., 3,818,846.

Commercial Shearing & Stamping Company: *See—*
Chlumecky, Nicholas, 3,818,710.

Commissariat a l'Energie Atomique: *See—*
Jacquelin, Roland, 3,819,479.

Commissioriat A l'Energie Atomique: *See—*
Berthelot, Guy; and Perez, Jean Jacques, 3,819,277.

Communications Satellite Corporation: *See—*
Haynos, Joseph G., 3,819,417.

Conde Kabushiki Kaisha: *See—*
Hlmeno, Shohachi, 3,818,592.

Condo, Albert C.: *See—*
Burt, Glenn R.; Condo, Albert C.; Eliason, Kay E.; and McCormack, John J., 3,818,712.

Condo, Albert C.; and Neubauer, Joseph J. N., to Atlantic Richfield Company. Stabilizing arctic ground cover. 3,818,711, Cl. 61-50.000.

Connor Engineering Corporation: *See—*
Day, Thomas L., 3,818,815.

Conrad Kern AG: *See—*
Frei, Ernst, 3,818,657.

Considine, William: *See—*
Seltzer, Raymond; and Considine, William, 3,819,576.

Consolidated Novelty Co., Inc.: *See—*
Mottel, Alan, 3,819,457.

Continental Can Company, Inc.: *See—*
Holk, Albert J., Jr., 3,819,083.

Continental Gummi-Werke Aktiengesellschaft: *See—*
Sohnemann, Richard, 3,819,471.

Continental Oil Company: *See—*
Weimer, Dean R., 3,819,048.

Contraves AG: *See—*
Schmied, Arthur, 3,818,597.

Control Concepts, Inc.: *See—*
Zeuner, Kenneth W., 3,818,927.

Controlled Printout Devices, Inc., mesne: *See—*
Ploeger, Walter, Jr.; and Bishop, John W. H., 3,819,026.

Cook, Gerald H.: *See—*
Baker, Philip G.; Cook, Gerald H.; and Downey, Rogers B., 3,820,149.

Cook, John A.: *See—*
Longoria, Juan, III; and Cook, John A., 3,819,541.

Coolen, Josephus Henricus: *See—*
Vermeulen, Geert Jan; and Coolen, Josephus Henricus, 3,818,952.

Coons, Gex B. Pressurized storage container. 3,819,040, Cl. 206-315.000.

Cooper, Glenn Adair; and Barham, Stanley H., to United States of America, Agriculture. Reducing defects in kiln drying lumber. 3,818,601, Cl. 34-13.400.

Copper Range Company: *See—*
Bushaw, Wayne; Halliday, Adam T.; Mukavitz, David R.; and Loan, Richard L., 3,819,362.

Copper Refineries Pty. Limited: *See—*
Sayer, Raymond Oliver, 3,818,744.

Corcoran, Vincent J., to Martin Marietta Corporation. Laser control system. 3,820,037, Cl. 331-94.50c.

Cordless Car Heater Co.: *See—*
Pfender, Emil, 3,818,884.

Cornacchia, Felice, to Fiat Societa per Azioni. Interlocking device for automobile doors. 3,819,228, Cl. 296-146.000.

Cornelison, Floyd S., Jr.; and Turner, Robert L. Golf instruction device. 3,820,130, Cl. 354-34.000.

Corning Glass Works: *See—*
Carter, Charles N.; and Sage, Burton H., 3,819,913.
Eppes, William R., 3,818,602.
Smith, Ward C., 3,818,897.

Cornwell, Charles E. Fireproofing, insulation and soundproofing material. 3,819,388, Cl. 106-86.000.

Corrette, Richard H.: *See—*
Yankee, Herbert L.; and Corrette, Richard H., 3,818,749.

Corson, Ben B.: *See—*
Gormley, William T.; and Corson, Ben B., 3,819,658.

Cosden Oil & Chemical Company: *See—*
Stevenson, John L.; and Archibald, William E., 3,819,492.

Cotton, Incorporated: *See—*
Starr, John R.; and Drennan, Arthur P., 3,819,462.

Couchois, William J.; and Doerfler, Roger E., to Kelsey-Hayes Company. Trailer sway control system. 3,819,234, Cl. 303-20.000.

Coughran, Samuel J., Jr., to Rome Industries. Quick hitch assembly. 3,818,551, Cl. 24-243.0fm.

Coulter Electronics, Inc.: *See—*
Doty, Edward N.; and Hogg, Walter R., 3,820,020.
Doty, Edward Neal; and Hogg, Walter R., 3,820,019.

Coulter, Gerald R., to Halliburton Company. Method for controlling movement of liquids and solids through a subterranean fracture. 3,818,990, Cl. 166-280.000.

Courard, Camille Alphonse; and Fritz, Ernst, to Eisenwerk Gesellschaft Maxmilianshutte. Device for blowing-in oxygen through the refractory lining of a metallurgical converter. 3,819,165, Cl. 266-41.000.

Cousino, Reynold J.: *See—*
Buhs, Marion W.; Cousino, Reynold J.; and DiFrank, Frank J., 3,818,812.

Coverley, Jack: *See—*
Priestly, Frank; Coverley, Jack; and Shulda, Raymond E., 3,819,127.

Cowley, Brian Richard; Graham, William; Humber, David Cedric; Wetherill, Aubrey; and White, William James, to Glaxo Laboratories Limited. Method of producing 7β-acylamido-3-methylceph-3-em-4-carboxylic acid esters. 3,819,622, Cl. 260-243.00c.

Crabbe, Pierre; Edwards, John A.; and Fried, John H., to Syntex (U.S.A.) Inc. 16,17-Seco-delta4,9(10)and-delta4,9(10),11 steroids. 3,819,686, Cl. 260-488.00b.

Cracknell, John Roland; and Groszek, Aleksander Jerzy, to British Petroleum Company Limited. Graphite pellets. 3,819,532, Cl. 252-447.000.

Craig, James T.: *See—*
Norris, Allan S.; and Craig, James T., 3,818,783.

Cramer, Werner: *See—*
Asselborn, Peter; Cramer, Werner; and Schmitz, Guenter, 3,819,073.

Creighton, David M., to International Telephone and Telegraph Corporation. Fluid monitoring system and fluid sampling method and apparatus for use therewith. 3,819,330, Cl. 23-254.00e.

Cremer, Dieter; and Hans, Rainer, to Interatom Internationale Atomreaktorbau GmbH. Device for discontinuously measuring the level of liquid metal supplied to a container. 3,818,759, Cl. 73-290.00r.

Cresswell, Harold William. Retention devices for sheet material. 3,818,550, Cl. 24-243.00k.

Creusot-Loire: *See—*
Pere, Gerard, 3,818,777.

Cricchi, James R.: *See—*
Vercellotti, Leonard C.; Britton, James S.; Ottobre, Louis G.; and Cricchi, James R., 3,820,073.

Crim, Ivan H.: *See—*
Pittman, Clarence E.; and Crim, Ivan H., 3,819,895.

Crivellaro, Gianbattista; and Oldani, Francesco, to Gruppo Lepetit S.p.A. Soluble tablets. 3,819,824, Cl. 424-44.000.

Crocker, Ralph H., Jr.: *See—*
Keith, Billy M.; Bussey, James R.; Cannon, Sidney E.; Patton, James C.; Fisher, Perry G.; Caldwell, Joseph H.; and Crocker, Ralph H., Jr., 3,819,837.

Cronin, John C.: *See—*
Perry, Elijah Robert; and Cronin, John C., 3,819,850.

Cross, Barrington, to American Cyanamid Company. Substituted phenylurea herbicides. 3,819,697, Cl. 260-553.00a.

Crowder, William E. Projectile tethered to rotatable target hoop. 3,819,183, Cl. 273-98.000.

Croy, Milton G.: *See—*
Stockton, Richard B.; Hunter, Roger A.; and Croy, Milton G., 3,819,873.

Crozier, David F.; and Bergman, Peter J., to American Manufacturing Company, Inc. Projective-reflective optical apparatus. 3,819,272, Cl. 356-138.000.

Crum, A. Elmer. Tobacco hoist. 3,819,013, Cl. 187-11.000.

Crum, Gerald W.; Reighard, Allan B.; and Tamny, Simon Z., to Nordson Corporation. Control system for an adhesive gun. 3,818,930, Cl. 137-341.000.

Cubic Corporation: *See—*
Watt, Richard E., 3,820,022.

Cullen, Michael J.: *See—*
Hoque, Abul M. M.; and Cullen, Michael J., 3,819,281.

Culp, Charles R.; and Otthofer, Jacob A., Jr., to Armstrong Cork Company. Carpet tile cutter. 3,818,790, Cl. 83-408.000.

Cummins, Alfred B. Exercise complex including bump ring and platform-type exerciser therein. 3,819,176, Cl. 272-63.000.

Cunningham, Donald F., to Cleveland Partition Corporation. Roll of separable partition strips. 3,819,041, Cl. 206-390.000.

Curley, John L.; Donahue, Thomas J.; Martland, Wallace A.; and Franklin, Benjamin S., to Honeywell Information Systems, Inc. Multi-level storage system having a buffer store with variable mapping modes. 3,820,078, Cl. 340-172.500.

Curtis & Marble Machine Company: *See—*
Davidson, Ralph L., 3,818,554.

Cutler-Hammer, Inc.: *See—*
Duncan, Eugene F., 3,819,888.

CVC Company: *See—*
Carsten, Paul W., 3,818,928.

CVS Chip Vending Services Limited: *See—*
Harris, Derek James; and Firth, Jack, 3,818,820.

Cyclone Seeder Company, Inc., The: *See—*
Walker, Jerry Wayne, 3,819,120.

Cyromagnetics Corporation: *See—*
Raymond, Jan Wayne; and Whetstone, Clay N., 3,818,578.

Dacam Corporation: *See—*
Cato, Carl P., 3,819,057.

Dahlsjo, Olof Gustav Robert: *See—*
Carlsson, Eric Ake Ragnar; Dahlsjo, Olof Gustav Robert; Karlsson, Goran Roland; and Pettersson, Kent Morgan, 3,820,116.

Daicel Ltd.: *See—*
Ishii, Kiyoshi; Konomi, Syobu; and Ishiguro, Yoshio, 3,819,513.

Daigle, Donald J.; Reeves, Wilson A.; and Drake, George L., Jr., to United States of America, Agriculture. Flame-resistant organic textiles through treatment with halogen containing soluble methylol phosphine adducts. 3,819,580, Cl. 260-47.00p.

Dainichi-Nippon Cables, Ltd.: *See—*
Kato, Hiroshi, 3,819,583.

Dainippon Pharmaceutical Co., Ltd.: *See—*
Yoshimura, Yoshio; Hosoki, Kanoo; Kurooka, Shigeru; and Iwamura, Kenichiro, 3,819,830.

D'Alelio, Gaetano F., to Doan Associates. Composition and means for oral hygiene. 3,819,826, Cl. 424-49.000.

Dalibor, Horst; Gutte, Richard; and Stenzel, Gunter, to Reichhold-Albert-Chemie Aktiengesellschaft. Process for gluing solid materials. 3,819,447, Cl. 156-330.000.

Dalla, Betta, Ralph A.; Gandhi, Haren S.; Kummer, Joseph T.; and Shelef, Mordecai, to Ford Motor Company. Process for preparing a catalyst based on ruthenium. 3,819,536, Cl. 252-462.000.

Daniel, Leonard Irving; Sadler, Thomas H.; Nawn, John F.; and French, David Walter, to Johns-Manville Corporation. Method and assembly for controlling thrust forces in a pipe arrangement. 3,819,210, Cl. 285-114.000.

Daniels, Henricus Petrus Cornelis: *See—*
Bourgeois, Ivan Marie Gaston Prudent; Daniels, Henricus Petrus Cornelis; and Verlet, Ronny Julius Camiel Cornelius, 3,819,961.

Daniels, Raymond Robert, to Raymond, Guy, Engineering Company Limited. Castors. 3,818,541, Cl. 16-18.00a.

Daniels, Roger D.; and Snover, John A., to Dow Chemical Company, The. Preparation of macrocrystalline, hexadonal aluminum hydride. 3,819,335, Cl. 23-300.000.

Dann, Murray: *See—*
Shu, Ping; and Dann, Murray, 3,819,836.

Dassler, Rudolf; Dreier, Horst; Strickle, Erich; and Muller, Norbert, to Puma-Sportschuhfabriken Rudolf Dassler KG. Outer sole for a sport shoe. 3,818,617, Cl. 36-32.00r.

Datshkovsky, Jose, deceased: *See—*
Penaloza, Arturo Casterjon; and Datshkovsky, Jose, deceased, 3,819,098.

Datshkovsky, Raisa Bardach, legal representative: *See—*
Penaloza, Arturo Casterjon; and Datshkovsky, Jose, deceased, 3,819,098.

Davey, John R.; Gilbo, Charles F.; Johnson, Norman A.; and Fritz, Thomas W., to Armstrong Cork Company. Joint construction for ceiling panels. 3,818,961, Cl. 144-326.00r.

Davidson, Jack H. Novelty aerial spinner device. 3,818,629, Cl. 46-53.000.

Davidson, Ralph L., to Curtis & Marble Machine Company. Pattern shearing device for pile fabrics. 3,818,554, Cl. 26-16.000.

Davis, David W.: *See—*
Johnson, Winston O.; and Davis, David W., 3,819,947.

Davis, George B., Jr. Pie crust form. 3,819,316, Cl. 425-470.000.

Davis, John Brian: *See—*
Robinson, William; Davis, John Brian; and Skilling, Derek, 3,819,776.

Davis, William H.: *See—*
Adorney, Charles S.; and Davis, William H., 3,820,133.

Dawe's Laboratories, Inc.: *See—*
Boehme, Werner R.; and Agusto, Robert G., 3,819,648.

Dawson, Charles R.: *See—*
Khurana, Ranbirsingh G.; and Dawson, Charles R., 3,819,726.

Dawson, Gary D.; and Harris, Robert S., to Chrysler Corporation. Exhaust gas recirculation control for internal combustion engines. 3,818,880, Cl. 123-119.00a.

Day Star Corporation: *See—*
Chamberlain, Timothy, 3,818,956.

Day, Thomas L., to Connor Engineering Corporation. Smudge eliminating variable volume selective pattern control air diffuser. 3,818,815, Cl. 98-40.00d.

De Boer, Thijs Johannes: *See—*
Johanns, Johannes Hendricus Maria; Van Roosmalen, Johannes Hendricus; and De Boer, Thijs Johannes, 3,819,969.

De Cleur, Eckhard: *See—*
Rudolph, Hans; Dhein, Rolf; De Cleur, Eckhard; and Kreuder, Hans-Joachim, 3,819,586.

De Fusco, Ernest L., to General Motors Corporation. Locking mechanism for a tilting vehicle seat. 3,819,142, Cl. 248-397.000.

De Hollander, William R., to General Electric Company. Conversion of uranium hexafluoride to uranium dioxide structures of controlled density and grain size. 3,819,804, Cl. 423-261.000.

De Lea, Anne C.: *See—*
Rush, Robert L.; Leon, Luis P.; and De Lea, Anne C., 3,819,488.

De Pasquale, Matthew J.: *See—*
Peiser, Alfred M.; and De Pasquale, Matthew J., 3,819,511.

De Ridder, Jon A.; and Kennedy, Alexander W., to Diamond Shamrock Corporation. Composite coating adherent under shear condition. 3,819,425, Cl. 148-6.160.

De Soto, Inc.: *See—*
Kreider, Robert W., 3,819,542.

De Weese, Ralph M.: *See—*
Aarons, Geoffrey L.; and De Weese, Ralph M., 3,819,206.

Deaton, David W., to Medical Concepts Inc. Inflatable patient enclosures. 3,818,896, Cl. 128-1.00b.

Debs, Victor, to Levolor Lorentzen, Inc. Inclined-plane venetian-blind installation. 3,818,969, Cl. 160-168.000.

DeCaro, David P.; and Gronceski, Gerald A., to National Steel Corporation. Process for producing non-silicon bearing electrical steel. 3,819,426, Cl. 148-120.000.

Deere & Company: *See—*
Benson, William Evan, 3,818,559.

Dehne, Clarence A., to Webb, Jervis B., Company. Power and free conveyor system. 3,818,840, Cl. 104-172.00s.

Del Bono, Mario, to Possis Corporation. Armature winding machine with improved lead staking means. 3,818,570, Cl. 29-205.00c.

Del Mar Engineering Laboratories: *See—*
Sanctuary, Clifford; Woods, Donald C.; and Bachman, John A., 3,818,901.

Delarge, Jacques E.; Thunus, Leopold Nicolas Joseph Victor; Lapiere, Charles-Leon Albert; and Georges, Andre Henri Eugene, to Christiaens, A., Societe Anonyme. 2-Meta-trifluoromethylanilinopyridine-5-N-acetyl sulfonamide. 3,819,639, Cl. 260-294.80f.

Delta Design Inc.: *See—*
Morton, William D., Jr., 3,818,838.

Demag Aktiengesellschaft: *See—*
Hubatsch, Gotthard, 3,819,161.

Dembiak, Matthew R.; and Webster, George H., said Dembiak assor. to Western Electric Company. Methods of making communications cables with sealed metallic moisture barriers. 3,819,434, Cl. 156-54.000.

Demers, Theodore E., to General Motors Corporation. Oil metering pump. 3,819,304, Cl. 417-375.000.

Demosthemes, Kiriazides K.: *See—*
Chatterji, Arun K.; Marianne, Custazzo; Demosthemes, Kiriazides K.; Russell, John J., Jr.; and Serio, John P., 3,819,367.

Demyon, Thomas R.; and LaCosta, Nicholas J. Electrical and visual fluid level sensor. 3,820,098, Cl. 340-244.00b.

Dengo, Tadao: *See—*
Suenaga, Masanobu; Machii, Tetsuo; Sawano, Takahiro; Kobayashi, Takehiko; Dengo, Tadao; and Nakai, Tetsuzp, 3,818,584.

Denki Kagaku Kogyo K.K.: *See—*
Fujii, Chiyuki; Sinike, Tsutomu; and Inoue, Yoshihau, 3,819,729.

Dera, Alain: *See—*
Bouthors, Pierre; Dera, Alain; and Lefeuvre, Andre, 3,819,196.

Derain, Christian, to Societe Nouvelle des Bennes Saphem. Device for loading a skip on to a vehicle. 3,819,075, Cl. 214-505.000.

Derolf, M. Robert: *See—*
Weldes, Helmut H.; Bobb, John S. Stephen; and Derolf, M. Robert, 3,819,392.

DeSchutter, Camiel R., to Perfect Module Systems, Inc. Wall retainer. 3,818,662, Cl. 52-285.000.

DeSchutter, Camiel R., to Perfect Module Systems, Inc. Wall panel extension clip. 3,818,670, Cl. 52-624.000.

Detroit Stoker Company: *See—*
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Deutsch, Howard. Pad slitter. 3,818,787, Cl. 83-7.000.

Deutsche Bendix Austustungs GmbH: *See—*
Thomas, Alfred William, 3,818,705.

Deutsche Edelstahlwerke Aktiengesellschaft: *See—*
Bungardt, Karl; Lehnert,Gunter; and Meinharde, Helmut W., 3,819,338.

Deutsche Edelstahlwerke GmbH: *See—*
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Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
Giesselmann, Gunter; Monch, Heinz; Schreyer, Gerd; and Weiberg, Otto, 3,819,818.
Von Bebenburg, Walter; and Posselt, Klaus, 3,819,617.
Von Bebenburg, Walter, 3,819,640.

DeVries Brothers Inc.: *See—*
DeVries, Roy F., 3,819,445.

DeVries, Roy F., to DeVries Brothers Inc. Process for manufacturing needlepoint canvas. 3,819,445, Cl. 156-277.000.

Dew, Robert C., to Stratton & Terstegge Co., Inc. Fire screen assembly. 3,818,891, Cl. 126-202.000.

DeWaal, William: *See—*
McKague, Allan B.; DeWaal, William; and VanWinckel, Carl E., 3,819,719.

Dewaele, Sylvain A. R.: *See—*
Dulog, Lothar G.; and Dewaele, Sylvain A. R., 3,819,748.

Dexter, Martin; and Knell, Martin, to Ciba-Geigy Corporation. Compositions of matter stabilized with 2,4,6-tris-(alkylthioalkylthio)-1,3,5 triazines. 3,819,572, Cl. 260-45.80n.

Dhein, Rolf: *See—*
Rudolph, Hans; Dhein, Rolf; De Cleur, Eckhard; and Kreuder, Hans-Joachim, 3,819,586.

Di Frank, Frank J.; and Greiwe, Daniel L., to Owens-Illinois, Inc. Corrugated board bundle stacker. 3,819,062, Cl. 214-1.00q.

Diagnostics Electronics Corporation: *See—*

Williams, James Bryan, 3,818,898.

Diamantoglou, Michael: *See—*
Bosshard, Hans; Diamantoglou, Michael; Koelliker, Hans Peter; and Karlen, Urs, 3,819,665.

Diamond, Allen M., to Beckman Instruments, Inc. Automatic start circuit for lamp. 3,819,981, Cl. 315-86.000.

Diamond, Christensen, Products Company: *See—*
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Diamond Power Specialty Corporation: *See—*
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Diamond Shamrock Corporation: *See—*
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Bluestone, Henry; and Osgood, Edmond R., 3,819,714.
Casson, Harold V.; Bennett, James S.; and Loftfield, Richard E., 3,819,503.
De Ridder, Jon A.; and Kennedy, Alexander W., 3,819,425.
Huba, Francis; and Malkin, Irving, 3,819,535.
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Diamondhead Corporation: *See—*
Lewis, Eugene C.; Gottlieb, C. Robert; and Macy, Robert H., 3,818,852.

Dick, Charles L., Jr.: *See—*
Ancker-Johnson, Betsy; and Dick, Charles L., Jr., 3,820,151.

Dickson, Colin G., to Spectrotherm Corporation. Manually operable mechanical and electrical connector. 3,820,135, Cl. 354-81.000.

Diesen, Ronald W.: *See—*
Murchison, Craig B.; Bailey, Robert E.; and Diesen, Ronald W., 3,819,516.

Dietrich, Dieter: *See—*
Assmus, Friedrich; Flaig, Hans; Dietrich, Dieter; and Hartner, Leo, 3,820,105.

DiFrank, Frank J.: *See—*
Buhs, Marion W.; Cousino, Reynold J.; and DiFrank, Frank J., 3,818,812.

Dillon, Thomas J., to Forest City Dillon, Inc. Building formed of cast vertical and horizontal members. 3,818,660, Cl. 52-251.000.

DiPaola, John J.: *See—*
Auer, John H., Jr.; Marsh, Donald B.; and DiPaola, John J., 3,819,932.

Dixon, William D., to Monsanto Company. Dialkyl acyl phosphonate,O-(alkylcarbamoyl) oximes. 3,819,751, Cl. 260-938.000.

DND Corporation: *See—*
Stunkard, Gerald A., 3,819,163.

Doan Associates: *See—*
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Dobson, John W., to International Telephone and Telegraph Corporation. Valve assembly. 3,819,146, Cl. 251-11.000.

Doe, Ernest Edward; and Millard, William Harry, to Bryan Donkin Company, Limited, The. Safety cut-off valves for gas supply systems. 3,818,932, Cl. 137-494.000.

Doerfler, Roger E.: *See—*
Couchois, William J.; and Doerfler, Roger E., 3,819,234.

Dole, Otto R.: *See—*
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Domain Industries, Inc.: *See—*
Grevich, John J.; and Gardetto, John J., 3,819,194.

Dominc, Joseph Dominic; and Schaulfelberger, Roy Henry, to Union Carbide Corporation. Hot melt compositions produced by irradiating ethylene copolymers in the presence of wax. 3,819,498, Cl. 204-159.140.

Donahue, Thomas J.: *See—*
Curley, John L.; Donahue, Thomas J.; Martland, Wallace A.; and Franklin, Benjamin S., 3,820,078.

Donaldson Company, Inc.: *See—*
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Donlee Manufacturing Industries Limited: *See—*
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Donnelly, Robert William: *See—*
Champion, Michael John; and Donnelly, Robert William, 3,820,053.

Donohue, James H.; and Zimmerman, Benjamin G., to United States of America, National Aeronautics and Space Administration. Passive dual-spin misalignment compensators. 3,818,767, Cl. 74-5.500.

Doreleijers, Theodorus Cornelis Gerardus: *See—*
Eisses, Reinhart Charles Willem; Bongenaar, Hendrik; and Doreleijers, Theodorus Cornelis Gerardus, 3,818,557.

Dorffel, Jorg; and Biethan, Uwe, to Chemische Werke Huels Aktiengesellschaft. Coating compositions. 3,819,757, Cl. 260-850.000.

Dornan, Arthur E.: *See—*
Radcliffe, Stanley L.; and Dornan, Arthur E., 3,819,016.

Dorr, Walter; and Glaser, Hermann K. A. Motor control system and method for fast spindle type impact presses. 3,819,993, Cl. 318-203.000.

Doty, Edward N.; and Hogg, Walter R., to Coulter Electronics, Inc. Particle study apparatus including an axial trajectory sensor. 3,820,020, Cl. 324-71.0cp.

Doty, Edward Neal; and Hogg, Walter R., to Coulter Electronics, Inc. Particle study apparatus including an axial trajectory sensor. 3,820,019, Cl. 324-71.0cd.

Dover Corporation (De-Sta-Co Division): *See—*
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Dow Chemical Company: *See—*
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Dow Chemical Company, The: *See—*
Bertram, James L.; Whiteside, Ross C., Jr.; and Franke, Preston H., Jr., 3,819,747.
Blanchard, Robert R., 3,819,554.
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Ervin, Gary D.; and Walters, Harold A., 3,819,463.
Glomski, Ronald L.; and Jones, Allen H., Jr., 3,819,593.
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Jones, Irby C., Jr.; and Noack, Walter E., 3,819,813.
Little, John C.; Teot, Arthur S.; and Harris, Robert F., 3,819,538.
Loeffler, Norman Raymond; and Prindle, Hershel Beebe, 3,819,557.
Longoria, Juan, III; and Cook, John A., 3,819,541.
Matzek, Norman E.; and Musinski, Donald F., 3,819,819.
Murchison, Craig B.; Bailey, Robert E.; and Diesen, Ronald W., 3,819,516.
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Dow Chemical Corporation, The: *See—*
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Dow Corning Corporation: *See—*
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Plante, Floyd A., 3,819,745.
Plueddemann, Edwin P., 3,819,675.

Downey, Rogers B.: *See—*
Baker, Philip G.; Cook, Gerald H.; and Downey, Rogers B., 3,820,149.

Downs, George W. Concealed maze puzzle. 3,819,187, Cl. 273-156.000.

Draber, Wilfried; Buchel, Karl-Heinz; Hammann, Ingeborg; and Frohberger, Paul-Ernst, to Bayer Aktiengesellschaft. Alpha-amino-alpha-acyl-carbonyl-phenylhydrazones. 3,819,703, Cl. 260-564.00r.

Drake, George L., Jr.: *See—*
Daigle, Donald J.; Reeves, Wilson A.; and Drake, George L., Jr., 3,819,580.

Draugelis, Vaidevutis C.; and Dole, Otto R., to Xerox Corporation. Cleaning apparatus. 3,819,263, Cl. 355-17.000.

Dreier, Horst: *See—*
Dassler, Rudolf; Dreier, Horst; Strickle, Erich; and Muller, Norbert, 3,818,617.

Drennan, Arthur P.: *See—*
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Dresser Industries, Inc.: *See—*
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Ellis, Gary D., 3,818,987.
Read, Norman Weldon, 3,818,988.

Drillick, Jacob H., to International Teleprinter Corporation. Stepping machanism for teleprinter. 3,819,028, Cl. 197-82.000.

Driscoll, Gary L.: *See—*
Moore, Robert E.; and Driscoll, Gary L., 3,819,721.

Driscoll, John J., to Polaroid Corporation. Photographic apparatus. 3,820,137, Cl. 354-86.000.

Droz, Francois. Bar lug for wrist watch case. 3,818,552, Cl. 24-265.00b.

Drummond, W. Wendell; and Hegedus, Walter J. Composite integrated rake and apparatus and method of manufacture thereof. 3,818,688, Cl. 56-400.010.

Du Pont de Nemours, E. I., and Company: *See—*
Baird, Bennett Ray, 3,819,569.
Booth, Charles Lawrence, 3,820,152.
Cargagna, Paul D., 3,819,562.
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Gale, David M., 3,819,677.
Holmes, David Alan; and Fasig, Edgar William, Jr., 3,819,594.
Howe, King Lau, 3,819,762.
Kwolek, Stephanie Louis, 3,819,587.
Langsdorf, William P., Jr., 3,819,353.
Nakata, Bruce Tadashi; and Wilhoit, Eugene Dennis, 3,819,730.
Schaefer, William E., 3,819,429.
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Dufaure, Pierre: *See—*
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Duffy, William M. Trolling device. 3,818,624, Cl. 43-43.130.

Dugan, William P., to General Dynamics Corporation. Method of manufacturing circuit board connectors. 3,819,430, Cl. 156-3.000.

Dugan-Chapman, Charles, to Stewart Plastics Limited. Tray. 3,818,634, Cl. 47-34.130.

Dukess, Joseph. Material for cap liner. 3,819,460, Cl. 161-42.000.

Dulog, Lothar G.; and Dewaele, Sylvain A. R., to S.A. Texaco Belgium N.V. Phosphorus derivatives of tetrafunctional aromatic compounds. 3,819,748, Cl. 260-927.00r.

Dumbill, Cyril G.: *See—*
Russell, Frederick; and Dumbill, Cyril G., 3,818,676.

Dunahue, Thomas J., to Honeywell Information Systems, Inc. Override hardware for main store sequencer. 3,820,081, Cl. 340-172.500.

Duncan, Eugene F., to Cutler-Hammer, Inc. Limit switch mechanism. 3,819,888, Cl. 200-47.000.

Dunford, Sidney G.; and Weaver, James R., to General Motors Corporation. Modular occupant restraint system. 3,819,205, Cl. 280-150.0ab.

Dunkley, Anthony F. M.: *See—*
Glanville, Lewis Malcolm; and Dunkley, Anthony F. M., 3,819,552.

Dunks, Clifford Matthew: *See—*
McCaulay, James Lindsay; and Dunks, Clifford Matthew, 3,819,365.

Dunlap Limited: *See—*
Hogg, Derek, 3,818,968.

Dunlop Limited: *See—*
Mitchell, William Eric, 3,818,565.

Dunn, Elman R., to Litton Industries, Inc. Apparatus for surface grinding. 3,818,639, Cl. 51-112.000.

Dunn, Elman R., to Litton Industries, Inc. Work carrier drive for double disc grinder with reversible drive and automatic stop means. 3,818,640, Cl. 51-114.000.

Dunn, John Karl. Tire removal and mounting tool. 3,818,967, Cl. 157-1.220.

Duprey, Richard H.: *See—*
Benoit, Roland A.; and Duprey, Richard H., 3,818,518.

Durham, John Anthony Douglas Bruce, to Mational Research Development Corporation. Optical surveying instrument. 3,819,280, Cl. 356-249.000.

Dursch, Friedrich; and Siewarga, Theodore Michael, to Squibb, E. R., & Sons, Inc. 7-(D-alpha-amino-1,4-cyclohexadien-l-ylacetamido) desacetoxycephalosporanic acid dihydrate. 3,819,620, Cl. 260-243.00c.

Dusevoir, Robert H. Discharge electrodes for electrostatic precipitators and method of shipment and installation. 3,819,985, Cl. 317-3.000.

Dustikin Products, Inc.: *See—*
Scheuer, Fred F., 3,818,533.

Duvall, Roanld Nash; Gold, Gerald; Hurtle, Richard La Verne; and Palermo, Blasey Thomas, to Miles Laboratories, Inc. Apparatus for particle size analysis. 3,819,269, Cl. 356-36.000.

Dvolaitzky, Frajda; Cognacq, Jean-Claude; and Ber, Esther, to Societe Civile Auguil. Derivatives of dibenzo(ad) 5H-cycloheptene, method of preparation, and application thereof. 3,819,723, Cl. 260-618.00r.

Dynamit Nobel AG: *See—*
Plankl, Leo Hans; Seiler, Claus-Dietrich; and Vahlensieck, Hans-Joachim, 3,819,400.

E. M. Partners A.G.: *See—*
Adlam, Francis Charles, 3,818,663.

E-Z Read Metric Rule, Inc.: *See—*
Hershire, Kent M., 3,818,598.

East, Robert D., to General Gas Light Company. Centrifugal pump assembly. 3,819,297, Cl. 417-38.000.

Easter, Edmond, to Fluid Flow, Inc. Electrical flow meter. 3,818,758, Cl. 73-204.000.

Eastman Kodak Company: *See—*
Beach, David E., 3,820,142.
Horton, William Howard, 3,820,138.
Kemp, Rodney J., 3,819,374.
Weaver, James C.; Gray, Theodore F., Jr.; and Combs, Robert L., 3,819,759.

Eaton Corporation: *See—*
Bedi, Ram D., 3,818,525.
Goscenski, Edward J., Jr., 3,818,781.
Line, Gerald D., 3,818,879.
Uppal, Sohan L., 3,819,307.
VanderBurgh, George William, 3,819,213.

Ebauches Tavannes S.A.: *See—*
Muller, Jacques, 3,818,689.

Eberle, Otto Eugen. Centrifugal vacuum casting apparatus. 3,818,974, Cl. 164-255.000.

Ebner, Theran L., to Houston Natural Gas Corporation. Data receiver. 3,820,075, Cl. 340-172.500.

Eckert, Terry T.: *See—*
Hauser, Ambrose A.; Eckert, Terry T.; and McDonel, James D., 3,819,295.

Ecodyne Corporation: *See—*
Pfleger, Robert K., 3,819,303.

Eddy, John W.: *See—*
Weber, Fred A.; Caputo, James P.; Eddy, John W.; Harrington, Phil R.; O'Toole, Gerald; Puccini, Sergio E.; and Adamski, Diane L., 3,819,865.

Edmonds, James T., Jr.: *See—*
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Edwards, John A.: *See—*
Crabbe, Pierre; Edwards, John A.; and Fried, John H., 3,819,686.

Edwards, Reginald Harold; and Owens, Geoffrey Lloyd. Testing tires. 3,818,755, Cl. 73-146.000.

Eells, Paul K. Abrading and polishing wheels. 3,818,651, Cl. 51-368.000.

Egan, Dale W.; Holstrom, Geoffrey B.; Lord, Harry C.; Stevens, Robert W.; Port, Darrell P.; and Howard, Rollen D., to Environmental Data Corporation. Spectrometers. 3,819,945, Cl. 250-373.000.

Eggenberger, Ulrich; and Zehnder, Josef, to Gebruder Buhler AG. Method for controlling operation of a press. 3,819,774, Cl. 264-40.000.

Eggert, Erwin: *See—*
Schmidt, Hans; Eggert, Erwin; and Schuckle, Gert, 3,819,420.

Ehren, Irwin Robert: *See—*
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Ehrhardt, Gerry H.; and Abernathy, Timothy G. Method of forming improved pressure sensitive transfer media. 3,819,397, Cl. 117-36.100.

Eifert, Melvin C.: *See—*
Young, Gregory G.; and Eifert, Melvin C., 3,818,611.

Eisai Co., Ltd.: *See—*
Inai, Yuichi; Okazaki, Kanzo; Uchiyama, Mikio; Shimada, Katsutoshi; Kagei, Kengo; and Bessho, Motoaki, 3,819,705.
Murao, Sawao; Satoi, Shuzo; Kuwana, Noriaki; Fukumura, Masayuki; and Kawamura, Tamio, 3,819,486.

Eisch, Richard S.: *See—*
Newman, Norman; and Eisch, Richard S., 3,819,372.

Eisemann, Kurt, to U.S. Philips Corporation. Arrangement in a record player for accurately adjusting the height of a friction wheel. 3,818,772, Cl. 74-107.000.

Eisenwerk Gesellschaft Maxmilianshutte: *See—*
Courard, Camille Alphonse; and Fritz, Ernst, 3,819,165.

Eisses, Reinhart Charles Willem; Bongenaar, Hendrik; and Doreleijers, Theodorus Cornelis Gerardus, to U. S. Philips Corporation. Method of manufacturing an implosion-free picture tube for television display. 3,818,557, Cl. 29-25.130.

Elders, Gerald W.; Schneider, Thomas E.; and Alongi, John R., to Lee-Norse Company, mesne. Apparatus for setting pins in mine roofs. 3,819,101, Cl. 227-130.000.

Electro-Nite Co.: *See—*
Kraus, Max H.; Baccellieri, Michael P.; and McClintock, Bruce, 3,818,762.

Electronique Marcel Dassault: *See—*
Casse, Robert; Robin, Henri; and Vallas, Gilbert, 3,820,119.
Clarisse, Christian, 3,820,021.

Eliason, Kay E.: *See—*
Burt, Glenn R.; Condo, Albert C.; Eliason, Kay E.; and McCormack, John J., 3,818,712.

Ellenberg, John D.: *See—*
Roberts, John D.; Ellenberg, John D.; and Keith, Charles H., 3,819,435.

Elliott, Herbert James. Method and apparatus for casting thermoplastic materials E.G. sulphur and bitumens. 3,819,793, Cl. 264-213.000.

Ellis, Gary D., to Dresser Industries, Inc. Well packer and retriever. 3,818,987, Cl. 166-134.000.

Ellis, George S.; Robertson, John; and Yew, Ming-Chin, to General Motors Corporation. Gas bladder for combination liquid gas suspension device. 3,819,166, Cl. 267-64.000.

Elson, Arthur M.: *See—*
Bauman, Joseph F.; and Elson, Arthur M., 3,819,069.

Emelyanenko, July Georgievich: *See—*
Paton, Boris Evgenievich; Theddvar, Boris Izrailevich; Latash, Jury Vadimovich; Chekotilo, Leonty Vasilievich; Emelyanenko, July Georgievich; Us, Vasily Ivandvich; Baglai, Vitaly Mikhailovich; Martyn, Viktor Mikhailovich; Artamonov, Viktor Leonidovich; Bonarenko, Oleg Petrovich; Boiko, Georgy Alexandrovich; Tsikulenko, Anatoly Konstantinovich; Ivon, Vasily Vladimirovich; and Pavlov, Leonid Viktorovich, 3,818,973.

Emhart Corporation: *See—*
Hart, Le Roy; Salonia, Thomas R.; and Bergen, Gary R., 3,819,214.

Endler, Abraham S., to Apex Chemical Co., Inc. Scorch-resistant water-soluble flame-retardants for cellulose. 3,819,518, Cl. 252-8.100.

Energy Conversion Devices, Inc.: *See—*
Klose, Peter M.; and Ovshinsky, Stanford R., 3,819,377.

Enfield, Norman W. Insulation board fabricated from refuse. 3,819,456, Cl. 161-7.000.

Engel, Walter H., to Porosan Interests, U.S.A., Inc. Method of producing a volatilizing article of manufacture. 3,819,405, Cl. 117-138.8ua.

Engineered Concrete Placer, Inc.: *See—*
Semple, Charles A., 3,818,807.

Englisch, Adolf. Method for removing the burr of chain-links. 3,818,694, Cl. 59-29.000.

Enomoto, Tatsuya; and Morita, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device. 3,819,952, Cl. 307-202.000.

Ensmann, Burt; and Hinz, Henry, to Ideal Toy Corporation. Object-lifting device including means for metering objects from storage station to pickup station. 3,818,628, Cl. 46-42.000.

Environmental Data Corporation: *See—*
Egan, Dale W.; Holstrom, Geoffrey B.; Lord, Harry C.; Stevens, Robert W.; Port, Darrell P.; and Howard, Rollen D., 3,819,945.

Eppes, William R., to Corning Glass Works. Drying apparatus. 3,818,602, Cl. 34-14.000.

Epstein, Peter F.; Caffrey, Joseph R.; and Yu, Pyung Kyung, to Baychem Corporation, mesne. Quaternary thenyl ammonium salts as plant growth control agents. 3,819,357, Cl. 71-90.000.

Erb, Ernst, to Erba Maschinenbau AG. Control device for the needles of a knitting machine. 3,818,728, Cl. 66-154.00a.

Erba Maschinenbau AG: *See—*
Erb, Ernst, 3,818,728.

Erectoweld Company Limited: *See—*
Walsh, Francis J., 3,819,078.

Erickson, Oscar A. Suture holder. 3,819,039, Cl. 206-388.000.

Erickson, Robert Edward: *See—*
Bozzato, Giuliano; Pesaro, Mario; Schudel, Peter; Hug-Inderbitzin, Marianne; and Erickson, Robert Edward, 3,819,711.

Eriksen, Odd, to Seritralinstitutt for Industriell Forskning. Device for sterile measurement of liquid or gas pressures. 3,818,765, Cl. 73-395.000.

Ervin, Gary D.; and Walters, Harold A., to Dow Chemical Company, The. Carpet and preparation thereof. 3,819,463, Cl. 161-64.000.

Espeel, Frans Joris, to Gebrueder Buehler AG. Pneumatic control system for air filter cleaning apparatus. 3,818,940, Cl. 137-624.140.

Esso Research and Engineering Company: *See*—
Howell, William G.; Carpenter, Steve H.; and Otto, Henry E., 3,819,103.
North, Howard C.; Calderwood, Gene C.; and Williamson, Charles W., 3,819,790.

Estandarte, Adolfo Umadhay, to SCM Corporation. Cleaning means for an overcoated photoconductive surface. 3,819,262, Cl. 355-15.000.

Etabissements Genoud & Cie, Societe Anonyme: *See*—
Chevallier, Pierre, 3,819,320.

Etablissements J. B. Gabriels S.P.R.L.: *See*—
Morjan, Jean, 3,819,084.

Etat Francais - Delegation Ministerielle pour l'Armemen: *See*—
Vivier, Albert F., 3,818,637.

Etat Francais represente par le Ministre d'Etat Charge de la Defense Nationale Delegation Ministerielle pour l'Armement Direction Technique des Constructions Navales: *See*—
Taboultier, Paul J.; and Abgrall, Rene J., 3,818,853.

Ethyl Corporation: *See*—
Ludt, William C., 3,820,014.

Etter, Walter: *See*—
Thevenaz, Jean; Etter, Walter; and Thevenaz, Louis, 3,819,129.

Etudes et Bonneterie S.A.: *See*—
Bourgeois, Norbert Paul, 3,818,724.

Etz, Herbert, to Hahn, Carl, Dr., KG. Catamenial tampon. 3,818,912, Cl. 128-285.000.

Etzbach, Volker; Forg, Wolfgang; and Grimm, Peter, to Linde Aktiengesellschaft. Process for the liquefaction and subcooling of natural gas. 3,818,714, Cl. 62-11.000.

Evans, James King. Heated liquid vacuum generator for use with a two chamber cleaning nozzle. 3,818,537, Cl. 15-321.000.

Evans, Jesse L.; and Hecker, Eugene L., to General Motors Corporation. Ventilated windowed oven door. 3,818,890, Cl. 126-200.000.

Evans, Jesse L., to General Motors Corporation. One-piece range drawer having integral skids. 3,819,247, Cl. 312-330.000.

Evans, Robert C.; and Hehmann, Horst W., to General Electric Company. Broad band acoustic barrier. 3,819,008, Cl. 181-33.00d.

Evans, Wendell Irving, to Cincinnati Milacron Inc. Quick-change wheel guard for tool and cutter grinder. 3,818,648, Cl. 51-268.000.

Ewry, Edwin E.: *See*—
Uitz, Mark O.; Ewry, Edwin E.; Link, William T.; and Sherlock, Hugh Paul, 3,819,257.

Expert Precision Electronic Research: *See*—
Rush, Michael M.; Subers, John E., Jr.; and Herring, Peter C., 3,819,855.

Extrude Hone Corporation: *See*—
Rhoades, Lawrence J., 3,819,343.

Ezekiel, Aaron David: *See*—
Squire, Elaine Josephine; and Ezekiel, Aaron David, 3,819,383.

Fa. J. N. Eberle & Cie. GmbH: *See*—
Imme, Helmut; Blaimberger, Robert; and Schulz, Gunter, 3,819,169.

Faber, Saul, to Faber, Saul, Corporation. Golf score grip for caddy carts. 3,819,907, Cl. 235-1.00b.

Faber, Saul, Corporation: *See*—
Faber, Saul, 3,819,907.

Factory Mutual Research Corporation: *See*—
Livingston, William L., 3,818,994.

Fadler, Walter: *See*—
Gesek, Rudolf; Fadler, Walter; and Bohn, Georg, 3,819,842.

Fahey, Darryl R.; and Kubicek, Donald H., to Phillips Petroleum Company. Alkynes removal from hydrocarbon streams. 3,819,738, Cl. 260-677.00a.

Fahey, Darryl R., to Phillips Petroleum Company. Alkyne removal from hydrocarbon streams. 3,819,739, Cl. 260-677.00a.

Fainman, Morton; and McAuley, Charles Strouse. Method of purifying lubricating oils. 3,819,508, Cl. 208-180.000.

Fairaizl, Max L.: *See*—
Martinec, Eugene F.; and Fairaizl, Max L., 3,818,540.

Fairbanks, Bernard: *See*—
Valatka, Daniel E.; and Fairbanks, Bernard, 3,818,835.

Falk, Morris: *See*—
Kotov, Illijus; Falk, Morris; and Falk, Sidney, 3,818,798.

Falk, Robert A.: *See*—
Kleiner, Eduard K.; and Falk, Robert A., 3,819,666.

Falk, Sidney: *See*—
Kotov, Illijus; Falk, Morris; and Falk, Sidney, 3,818,798.

Faller, Werner: *See*—
Himmelsbach, Paul; and Faller, Werner, 3,820,096.

Farber, Joseph: *See*—
Brown, Wade; and Farber, Joseph, 3,819,574.

Fargo, Harland E.; and Smucker, Clayton A., to Owens-Corning Fiberglas Corporation. Process for making glass fiber product using phenolic binder resins. 3,819,441, Cl. 156-167.000.

Faris, Edwin E.: *See*—
Nesson, Israel; Faris, Edwin E.; and Spezial, Ronald, 3,820,146.

Farnung, Hermann, to Wagner & Co. Fahrzeugteidefabrick. Reflector element mounting structure for bicycle pedals. 3,818,856, Cl. 116-28.00r.

Faroudja, Yves Charles; and Kowal, Leonard, to International Video Corporation. Phased color under video recording and playback method and apparatus. 3,820,154, Cl. 358-8.000.

Farrer, Leland M., to Systron Donmer Corporation. Electrically tunable tuned-line oscillator. 3,820,039, Cl. 331-99.000.

Farrington Business Machines Corporation: *See*—
Geiger, Franklin O., 3,818,826.
Patterson, James M., Jr., 3,818,829.

Farrow, Tom Jay; and O'Donnell, Thomas P., to Owens-Illinois, Inc. Flue gas temperature control system. 3,818,682, Cl. 55-106.000.

Fasig, Edgar William, Jr.: *See*—
Holmes, David Alan; and Fasig, Edgar William, Jr., 3,819,594.

Fauke, Allen R.; and Buriks, Rudolf S., to Petrolite Corporation. Polymeric quaternary ammonium betaines. 3,819,589, Cl. 260-78.50t.

Faust, Elbert R., to Buerhler Corporation, The. Continuous plating system. 3,819,501, Cl. 204-198.000.

Fearon, Edward R., to Stop-Loss Incorporated, mesne. System for detecting an object within a magnetic field. 3,820,103, Cl. 340-280.000.

Fearon, Edward R., to Stop-Loss Incorporated. Method and system for detecting an object within a magnetic field interrogation zone. 3,820,104, Cl. 340-280.000.

Feasey, Ronald George, to Imperial Chemical Industries Limited. Polysulphones. 3,819,582, Cl. 260-63.00r.

Feather Hill Industries, Inc.: *See*—
Boehland, Robert R., Jr., 3,818,868.

Fehlner, Francis P. Electrochemical method of mining. 3,819,231, Cl. 299-4.000.

Feindler, Ernst; and Keiner, Heinz, to Leitz, Ernst, GmbH. Box-shaped still camera. 3,820,147, Cl. 354-288.000.

Feit, Peter Werner; and Nielsen, Ole Bent T., to Lovens Kemiske Fabrik Produktionsaktieselskab. Benzoic acid derivatives. 3,819,692, Cl. 260-519.000.

Feldman, Martin; and King, Michael Charles, to Bell Telephone Laboratories, Incorporated. Scanning projection printer apparatus and method. 3,819,265, Cl. 355-51.000.

Felten & Guilleaume Kabelwerke Aktiengesellschaft: *See*—
Asselborn, Peter; Cramer, Werner; and Schmitz, Guenter, 3,819,073.

Ferguson, Hugh S., to Reel Vortex, Inc. Aerodynamic performance of cross-flow mowers. 3,818,684, Cl. 56-13.300.

Ferguson, Norman T.: *See*—
Hemsath, Klaus H.; Vereecke, Frank J.; and Ferguson, Norman T., 3,819,323.

Ferrari, Giuseppe; and Griselli, Pier Luigi, to Montecatini Edison S.p.A. Process for the synthesis of alcohols. 3,819,727, Cl. 260-638.0hf.

Ferro, Walter: *See*—
Baldassarri, Agostino; and Ferro, Walter, 3,819,380.

Fiat Societa per Azioni: *See*—
Cornacchia, Felice, 3,819,228.
Peruglia, Marco, 3,818,717.

Field, Allen I.; and Field, Sidney P. Embroidery hoop. 3,818,620, Cl. 38-102.200.

Field, Sidney P.: *See*—
Field, Allen I.; and Field, Sidney P., 3,818,620.

Filipiev, Oleg Vladimirovich: *See*—
Andoniev, Sergei Mikhailovich; Zilberman, Leonid Borisovich; Kudinov, Gennady Alexandrovich; Kutsykovich, Dorina Borisovna; Lukashev, Vladimir Afanasievich; Raikovsky, Jury Borisovich; and Filipiev, Oleg Vladimirovich, 3,818,870.

Filreis, Manuel, to Minnesota Mining Manufacuring Company. Cable plugging apparatus. 3,819,037, Cl. 206-222.000.

Fink, Werner; and Kircher, Dieter, to ITT Industries, Inc. Antiskid control arrangement. 3,819,236, Cl. 303-21.00f.

Finke, Arthur A., to Allen Group Incorporated. Marine antenna mount. 3,819,136, Cl. 248-42.000.

Finnemore, Harlan E., to Air Preheater Company, The. Inter-locking rotor assembly. 3,818,978, Cl. 165-9.000.

Finnimore, Bryan: *See*—
O'Brien, John Leslie; Finnimore, Bryan; and Hogg, Dallas John Arthur, 3,818,862.

Firestone Tire & Rubber Company, The: *See*—
Halasa, Adel F., 3,819,764.

First National Bank of Miami, mesne: *See*—
Kiess, Raymond W.; and Stewart, Peter H., 3,819,276.

Firth, Jack: *See*—
Harris, Derek James; and Firth, Jack, 3,818,820.

Firth, Robert L., to Donaldson Company, Inc. Fluid filter. 3,819,052, Cl. 210-90.000.

Fischer, Ernest John, to Gillette Company, The. Hair dryer with hood. 3,818,600, Cl. 34-99.000.

Fischer, Roman: *See*—
Beck, Fritz; Sabelus, Guenther; Fischer, Roman; and Haufe, Juergen, 3,819,548.

Fisher, Perry G.: *See*—
Keith, Billy M.; Bussey, James R.; Cannon, Sidney E.; Patton, James C.; Fisher, Perry G.; Caldwell, Joseph H.; and Crocker, Ralph H., Jr., 3,819,837.

Fisons Limited: *See*—

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Fitzpatrick, John J.: *See—*
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Flaig, Hans: *See—*
Assmus, Friedrich; Flaig, Hans; Dietrich, Dieter; and Hartner, Leo, 3,820,105.

Flanigan, William J.: *See—*
Flumignan, Dennis P.; and Flanigan, William J., 3,819,894.

Fleischhacker, Joseph F.; and Wallace, Lindsay A., to Tescom Corporation. Liquid manometer. 3,818,766, Cl. 73-406.000.

Fleissner, Heinz, to Vepa AG. Process and apparatus for the treatment of material lengths. 3,818,607, Cl. 34-115.000.

Flexible Metal Hose Manufacturing Company: *See—*
Baker, Robert W., 3,819,849.

Florig, Albert J.: *See—*
Clarke, Edwin E.; and Florig, Albert J., 3,819,070.

Florig Equipment Company, Inc.: *See—*
Clarke, Edwin E.; and Florig, Albert J. (Florig assor. to), 3,819,070.

Fluid Flow, Inc.: *See—*
Easter, Edmond, 3,818,758.

Flukiger, Max, to Leder & Co. AG. Picker strap for underpick looms. 3,818,953, Cl. 139-161.00r.

Flumignan, Dennis P.; and Flanigan, William J., to Gulf & Western Industries, Inc. Rotary switch with linear plunger and helical motion transferring means. 3,819,894, Cl. 200-156.000.

FMC Corporation: *See—*
Goldstein, David, 3,819,810.
Kalmar, Arthur F., 3,818,859.
Massengale, John T.; and Koch, Walter T., 3,819,401.
Throner, Guy C., Jr., 3,818,833.
Weir, Stanley M., 3,819,068.

Focella, Antonino: *See—*
Brossi, Arnold; Focella, Antonino; and Teitel, Sidney, 3,819,725.

Foley, John T., to Witco Chemical Corporation. Water-soluble salts of imidazolines with phosphoric acid esters of (A) ethoxylated long chain alcohols and (B) ethoxylated alkyl phenols. 3,819,647, Cl. 260-309.600.

Forbes, Bert E.: *See—*
Bergh, Arndt B.; Forbes, Bert E., Hamilton, James O., III; and Mixsell, Joseph C., Jr., 3,820,079.

Forbes, Hampton E., Jr., to Westvaco Corporation. Slide top dispensing carton. 3,819,093, Cl. 222-529.000.

Ford Motor Company: *See—*
Barrera, Carlos M.; Stark, Clarence C.; and Stark, Clarence C., 3,818,877.
Dalla, Betta, Ralph A.; Gandhi, Haren S.; Kummer, Joseph T.; and Shelef, Mordecai, 3,819,536.

Fordice, Michael W.: *See—*
Shen, Tsung-Ying; Fordice, Michael W.; Ruyle, William V.; and Jensen, Norman P., 3,819,603.

Forest City Dillon, Inc.: *See—*
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Forg, Wolfgang: *See—*
Etzbach, Volker; Forg, Wolfgang; and Grimm, Peter, 3,818,714.

Forshay, Richard D.: *See—*
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Forster, Karl Heinz: *See—*
Johne, Albrecht; Forster, Karl Heinz; and Schanze, Klaus, 3,818,827.

Fort Lock Corporation: *See—*
Kotov, Illijus; Falk, Morris; and Falk, Sidney, 3,818,798.

Fortune, William S. Desoldering implement. 3,818,539, Cl. 15-341.000.

Foster, Michael R.; and Hartley, Frederick J., to General Motors Corporation. Carburetor induction limiting device. 3,818,701, Cl. 60-277.000.

Fotis, Peter; and Boone, David E., to Standard Oil Company. Catalyst and process for the polymerization of ethylene and therminal olefins. 3,819,599, Cl. 260-94.9da.

Fountain, Laurence R., to Fountain Plating Company, Inc. Method of removing braze. 3,819,494, Cl. 204-146.000.

Fountain Plating Company, Inc.: *See—*
Fountain, Laurence R., 3,819,494.

Four Agenturer AB, mesne: *See—*
Hilgemann, Hans, 3,818,979.

Fournier, Erick-Pierre. Medicament and swab type applicators. 3,818,911, Cl. 128-269.000.

Fox, Charles W., to McCabe-Powers Body Company. Control system for a derrick utilizing light multiplex communication link. 3,820,070, Cl. 340-147.00r.

Foxworthy, Eugene R.; Blatter, Albert; Gamber, William N.; Presley, Rex W.; and Verge, Kenneth W., to Bendix Corporation, The. System for augmenting aircraft attitude stability using vertical vane type sensors. 3,819,135, Cl. 244-77.00d.

Fozzard, George B., to Phillips Petroleum Company. Process for separating halogenated hydrocarbons by extaactive distillation. 3,819,493, Cl. 203-70.000.

Fracke, Aribert; deceased (by Fracke, Waltraut; legal representative); and Wachtler, Hans, to Siemens Aktiengesellschaft. Apparatus for measuring the local neutron density distribution in the interior of a nuclear reactor. 3,819,946, Cl. 250-374.000.

Fracke, Waltraut: *See—*
Fracke, Aribert; and Wachtler, Hans, 3,819,946.

Frank, Charles E.: *See—*
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Frank, William R.: *See—*
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Franke, Norman W.: *See—*
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Franke, Preston H., Jr.: *See—*
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Franklin, Benjamin S.: *See—*
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Franz, Edmund C.: *See—*
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Frederiksen, Erling Kund; and Godtfredsen, Wagn Ole, to Lovens Kemiske Fabrik Produktionsaktieselskab. Esters of 6-amino penicillanic acid. 3,819,643, Cl. 260-306.700.

Freedman, Gerald Allen. Sectioned shell puzzles. 3,819,188, Cl. 273-160.000.

Freeman, Carl R., to Julian Engineering Company. Atmosphere circulation system. 3,818,813, Cl. 98-33.00a.

Freese, Charles E. Heat exchanger for compressed air dryer. 3,818,718, Cl. 62-272.000.

Frehn, Fritz, to Deutsche Edelstahlwerke GmbH. Welding hard metal composition. 3,819,364, Cl. 75-122.000.

Frei, Ernst, to Conrad Kern AG. Telescopic mast. 3,818,657, Cl. 52-115.000.

French, David Walter: *See—*
Daniel, Leonard Irving; Sadler, Thomas H.; Nawn, John F.; and French, David Walter, 3,819,210.

Frick, Harold Louis, to Whirlpool Corporation. Ceramic cooktop with a spiralled heating coil element assembly. 3,819,903, Cl. 219-464.000.

Fried, John H.: *See—*
Crabbe, Pierre; Edwards, John A.; and Fried, John H., 3,819,686.
Pfister, Jurg R.; Harrison, Ian T.; and Fried, John H., 3,819,654.

Friedman, Stanley Joel: *See—*
Blahut, Donald Edgar; Friedman, Stanley Joel; and Nash, Donald Henry, 3,819,877.

Friend, Lindsay C., to Du Pont de Nemours, E. I., and Company. Insulation pierce type connector. 3,820,058, Cl. 339-99.00r.

Fritz, Ernst: *See—*
Courard, Camille Alphonse; and Fritz, Ernst, 3,819,165.

Fritz Fuss K.G.: *See—*
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Fritz, Thomas W.: *See—*
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Frohberger, Paul-Ernst: *See—*
Draber, Wilfried; Buchel, Karl-Heinz; Hammann, Ingeborg; and Frohberger, Paul-Ernst, 3,819,703.
Kuhle, Engelber; Klauke, Erich; Hammann, Ingeborg; Hamburger, Brigitte; and Frohberger, Paul-Ernst, 3,819,684.
Zumach, Gerhard; Siegle, Peter; Hammann, Ingeborg; and Frohberger, Paul-Ernst, 3,819,649.

Fromel, Gustav, to Siemens Aktiengesellschaft. Spacer for fuel rods of nuclear light-water reactors. 3,819,477, Cl. 176-76.000.

Fry, William Lawrence, to Rists Wires & Cables Limited. Wiring harnesses. 3,819,848, Cl. 174-72.00a.

Fryer, Rodney Ian; and Sternbach, Leo Henryk, to Hoffmann-La Roche Inc. 7-Chloro-5-(2-fluorophenyl)-1-(2-hydroxyethyl)-1,3-dihydro -2H-1,4-benzodiazepin-2-one and esters thereof. 3,819,602, Cl. 260-239.30d.

Fuji Electric Company Limited: *See—*
Mouri, Mineju; and Aoki, Katsuhiko, 3,820,094.

Fuji Photo Film Co., Ltd.: *See—*
Kitamoto, Tatsuji; and Yamada, Yasuyuki, 3,819,411.
Yamamoto, Nobuo; Nagao, Kameji; and Horie, Ikutaro, 3,819,608.

Fujii, Chiyuki; Sinike, Tsutomu; and Inoue, Yoshihau, to Denki Kagaku Kogyo K.K. Process for producing 1-chloro-1-fluoroethylene. 3,819,729, Cl. 260-653.300.

Fujii, Takeshi: *See—*
Aito, Yuzo; Fujii, Takeshi; Saiki, Noritsugu; Shuji, Irie; and Yasujuni, Nakatsuji, 3,810,760.
Yamashita, Gentaro; Fujii, Takeshi; and Sakota, Koichiro, 3,819,695.

Fujimoto, Yasuo; and Koiwa, Yoichi. Process for saponifying polypeptides containing a unit of glutamic acid-gamma-ester using a mixture of alcohols in the presence of an alkaline metal hydroxide. 3,819,588, Cl. 260-78.00a.

Fujino, Masahiko: *See—*
Horii, Satoshi; Mizokami, Nariakira; Fujino, Masahiko; Shinagawa, Susumu; Ochiai, Michihiko; and Okutani, Tetsuya, 3,819,619.

Fujio, Yoshio, to Mitsubishi Denki Kabushiki Kaisha. Data recording and reproducing system. 3,819,874, Cl. 179-100.30a.

Fujisawa Pharmaceutical Co., Ltd.: *See—*
Morimoto, Akira; Kariyone, Kazuo; Kurita, Masaru; Hashimoto, Masashi; and Nishiwaki, Osamu, 3,819,621.
Takano, Tadayoshi; Kurita, Masaru; Nikaido, Hiroo; Mera, Masashi; Konishi, Nobukiyo; and Okui, Ritsuko, 3,819,623.

Fujita, Keiichi, to Kabushiki-Kaisha Tokai-Rika-Denki-Seisakusho. Rod end cold forming process. 3,818,746, Cl. 72-356.000.

Eriksen, Odd, to Sentralinstitutt for Industriell Forskning. Device for sterile measurement of liquid or gas pressures. 3,818,765, Cl. 73-395.000.

Ervin, Gary D.; and Walters, Harold A., to Dow Chemical Company, The. Carpet and preparation thereof. 3,819,463, Cl. 161-64.000.

Espeel, Frans Joris, to Gebrueder Buehler AG. Pneumatic control system for air filter cleaning apparatus. 3,818,940, Cl. 137-624.140.

Esso Research and Engineering Company: *See—*
Howell, William G.; Carpenter, Steve H.; and Otto, Henry E., 3,819,103.
North, Howard C.; Calderwood, Gene C.; and Williamson, Charles W., 3,819,790.

Estandarte, Adolfo Umadhay, to SCM Corporation. Cleaning means for an overcoated photoconductive surface. 3,819,262, Cl. 355-15.000.

Etabissements Genoud & Cie, Societe Anonyme: *See—*
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Etudes et Bonneterie S.A.: *See—*
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Etz, Herbert, to Hahn, Carl, Dr., KG. Catamenial tampon. 3,818,912, Cl. 128-285.000.

Etzbach, Volker; Forg, Wolfgang; and Grimm, Peter, to Linde Aktiengesellschaft. Process for the liquefaction and subcooling of natural gas. 3,818,714, Cl. 62-11.000.

Evans, James King. Heated liquid vacuum generator for use with a two chamber cleaning nozzle. 3,818,537, Cl. 15-321.000.

Evans, Jesse L.; and Hecker, Eugene L., to General Motors Corporation. Ventilated windowed oven door. 3,818,890, Cl. 126-200.000.

Evans, Jesse L., to General Motors Corporation. One-piece range drawer having integral skids. 3,819,247, Cl. 312-330.000.

Evans, Robert C.; and Hehmann, Horst W., to General Electric Company. Broad band acoustic barrier. 3,819,008, Cl. 181-33.00d.

Evans, Wendell Irving, to Cincinnati Milacron Inc. Quick-change wheel guard for tool and cutter grinder. 3,818,648, Cl. 51-268.000.

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Imme, Helmut; Blaimberger, Robert; and Schulz, Gunter, 3,819,169.

Faber, Saul, to Faber, Saul, Corporation. Golf score grip for caddy carts. 3,819,907, Cl. 235-1.00b.

Faber, Saul, Corporation: *See—*
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Factory Mutual Research Corporation: *See—*
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Fadler, Walter: *See—*
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Fahey, Darryl R.; and Kubicek, Donald H., to Phillips Petroleum Company. Alkynes removal from hydrocarbon streams. 3,819,738, Cl. 260-677.00a.

Fahey, Darryl R., to Phillips Petroleum Company. Alkyne removal from hydrocarbon streams. 3,819,739, Cl. 260-677.00a.

Fainman, Morton; and McAuley, Charles Strouse. Method of purifying lubricating oils. 3,819,508, Cl. 208-180.000.

Fairaizl, Max L.: *See—*
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Fairbanks, Bernard: *See—*
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Falk, Sidney: *See—*
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Farber, Joseph: *See—*
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Fargo, Harland E.; and Smucker, Clayton A., to Owens-Corning Fiberglas Corporation. Process for making glass fiber product using phenolic binder resins. 3,819,441, Cl. 156-167.000.

Faris, Edwin E.: *See—*
Nesson, Israel; Faris, Edwin E.; and Spezial, Ronald, 3,820,146.

Farnung, Hermann, to Wagner & Co. Fahrzeugteidefabrick. Reflector element mounting structure for bicycle pedals. 3,818,856, Cl. 116-28.00r.

Faroudja, Yves Charles; and Kowal, Leonard, to International Video Corporation. Phased color under video recording and playback method and apparatus. 3,820,154, Cl. 358-8.000.

Farrer, Leland M., to Systron Donner Corporation. Electrically tunable tuned-line oscillator. 3,820,039, Cl. 331-99.000.

Farrington Business Machines Corporation: *See—*
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Patterson, James M., Jr., 3,818,829.

Farrow, Tom Jay; and O'Donnell, Thomas P., to Owens-Illinois, Inc. Flue gas temperature control system. 3,818,682, Cl. 55-106.000.

Fasig, Edgar William, Jr.: *See—*
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Fauke, Allen R.; and Buriks, Rudolf S., to Petrolite Corporation. Polymeric quaternary ammonium betaines. 3,819,589, Cl. 260-78.50t.

Faust, Elbert R., to Buerhler Corporation, The. Continuous plating system. 3,819,501, Cl. 204-198.000.

Fearon, Edward R., to Stop-Loss Incorporated, mesne. System for detecting an object within a magnetic field. 3,820,103, Cl. 340-280.000.

Fearon, Edward R., to Stop-Loss Incorporated. Method and system for detecting an object within a magnetic field interrogation zone. 3,820,104, Cl. 340-280.000.

Feasey, Ronald George, to Imperial Chemical Industries Limited. Polysulphones. 3,819,582, Cl. 260-63.00r.

Feather Hill Industries, Inc.: *See—*
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Fehlner, Francis P. Electrochemical method of mining. 3,819,231, Cl. 299-4.000.

Feindler, Ernst; and Keiner, Heinz, to Leitz, Ernst, GmbH. Box-shaped still camera. 3,820,147, Cl. 354-288.000.

Feit, Peter Werner; and Nielsen, Ole Bent T., to Lovens Kemiske Fabrik Produktionsaktieselskab. Benzoic acid derivatives. 3,819,692, Cl. 260-519.000.

Feldman, Martin; and King, Michael Charles, to Bell Telephone Laboratories, Incorporated. Scanning projection printer apparatus and method. 3,819,265, Cl. 355-51.000.

Felten & Guilleaume Kabelwerke Aktiengesellschaft: *See—*
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Ferguson, Hugh S., to Reel Vortex, Inc. Aerodynamic performance of cross-flow mowers. 3,818,684, Cl. 56-13.300.

Ferguson, Norman T.: *See—*
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Ferrari, Giuseppe; and Griselli, Pier Luigi, to Montecatini Edison S.p.A. Process for the synthesis of alcohols. 3,819,727, Cl. 260-638.0hf.

Ferro, Walter: *See—*
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Fiat Societa per Azioni: *See—*
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Field, Allen I.; and Field, Sidney P. Embroidery hoop. 3,818,620, Cl. 38-102.200.

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Field, Allen I.; and Field, Sidney P., 3,818,620.

Filipiev, Oleg Vladimirovich: *See—*
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Filreis, Manuel, to Minnesota Mining Manufacuring Company. Cable plugging apparatus. 3,819,037, Cl. 206-222.000.

Fink, Werner; and Kircher, Dieter, to ITT Industries, Inc. Antiskid control arrangement. 3,819,236, Cl. 303-21.00f.

Finke, Arthur A., to Allen Group Incorporated. Marine antenna mount. 3,819,136, Cl. 248-42.000.

Finnemore, Harlan E., to Air Preheater Company, The. Inter-locking rotor assembly. 3,818,978, Cl. 165-9.000.

Finnimore, Bryan: *See—*
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Firth, Jack: *See—*
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Firth, Robert L., to Donaldson Company, Inc. Fluid filter. 3,819,052, Cl. 210-90.000.

Fischer, Ernest John, to Gillette Company, The. Hair dryer with hood. 3,818,600, Cl. 34-99.000.

Fischer, Roman: *See—*
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Fleischhacker, Joseph F.; and Wallace, Lindsay A., to Tescom Corporation. Liquid manometer. 3,818,766, Cl. 73-406.000.
Fleissner, Heinz, to Vepa AG. Process and apparatus for the treatment of material lengths. 3,818,607, Cl. 34-115.000.
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Flumignan, Dennis P.; and Flanigan, William J., to Gulf & Western Industries, Inc. Rotary switch with linear plunger and helical motion transferring means. 3,819,894, Cl. 200-156.000.
FMC Corporation: *See—*
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Foley, John T., to Witco Chemical Corporation. Water-soluble salts of imidazolines with phosphoric acid esters of (A) ethoxylated long chain alcohols and (B) ethoxylated alkyl phenols. 3,819,647, Cl. 260-309.600.
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Ford Motor Company: *See—*
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Dalla, Betta, Ralph A.; Gandhi, Haren S.; Kummer, Joseph T.; and Shelef, Mordecai, 3,819,536.
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Fortune, William S. Desoldering implement. 3,818,539, Cl. 15-341.000.
Foster, Michael R.; and Hartley, Frederick J., to General Motors Corporation. Carburetor induction limiting device. 3,818,701, Cl. 60-277.000.
Fotis, Peter; and Boone, David E., to Standard Oil Company. Catalyst and process for the polymerization of ethylene and therminal olefins. 3,819,599, Cl. 260-94.9da.
Fountain, Laurence R., to Fountain Plating Company, Inc. Method of removing braze. 3,819,494, Cl. 204-146.000.
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Fournier, Erick-Pierre. Medicament and swab type applicators. 3,818,911, Cl. 128-269.000.
Fox, Charles W., to McCabe-Powers Body Company. Control system for a derrick utilizing light multiplex communication link. 3,820,070, Cl. 340-147.00r.
Foxworthy, Eugene R.; Blatter, Albert; Gamber, William N.; Presley, Rex W.; and Verge, Kenneth W., to Bendix Corporation, The. System for augmenting aircraft attitude stability using vertical vane type sensors. 3,819,135, Cl. 244-77.00d.
Fozzard, George B., to Phillips Petroleum Company. Process for separating halogenated hydrocarbons by extaactive distillation. 3,819,493, Cl. 203-70.000.
Fracke, Aribert; deceased (by Fracke, Waltraut; legal representative); and Wachtler, Hans, to Siemens Aktiengesellschaft. Apparatus for measuring the local neutron density distribution in the interior of a nuclear reactor. 3,819,946, Cl. 250-374.000.
Fracke, Waltraut: *See—*
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Frank, Charles E.: *See—*
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Frederiksen, Erling Kund; and Godtfredsen, Wagn Ole, to Lovens Kemiske Fabrik Produktionsaktieselskab. Esters of 6-amino penicillanic acid. 3,819,643, Cl. 260-306.700.
Freedman, Gerald Allen. Sectioned shell puzzles. 3,819,188, Cl. 273-160.000.
Freeman, Carl R., to Julian Engineering Company. Atmosphere circulation system. 3,818,813, Cl. 98-33.00a.
Freese, Charles E. Heat exchanger for compressed air dryer. 3,818,718, Cl. 62-272.000.
Frehn, Fritz, to Deutsche Edelstahlwerke GmbH. Welding hard metal composition. 3,819,364, Cl. 75-122.000.
Frei, Ernst, to Conrad Kern AG. Telescopic mast. 3,818,657, Cl. 52-115.000.
French, David Walter: *See—*
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Frick, Harold Louis, to Whirlpool Corporation. Ceramic cooktop with a spiralled heating coil element assembly. 3,819,903, Cl. 219-464.000.
Fried, John H.: *See—*
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Pfister, Jurg R.; Harrison, Ian T.; and Fried, John H., 3,819,654.
Friedman, Stanley Joel: *See—*
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Friend, Lindsay C., to Du Pont de Nemours, E. I., and Company. Insulation pierce type connector. 3,820,058, Cl. 339-99.00r.
Fritz, Ernst: *See—*
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Zumach, Gerhard; Siegle, Peter; Hammann, Ingeborg; and Frohberger, Paul-Ernst, 3,819,649.
Fromel, Gustav, to Siemens Aktiengesellschaft. Spacer for fuel rods of nuclear light-water reactors. 3,819,477, Cl. 176-76.000.
Fry, William Lawrence, to Rists Wires & Cables Limited. Wiring harnesses. 3,819,848, Cl. 174-72.00a.
Fryer, Rodney Ian; and Sternbach, Leo Henryk, to Hoffmann-La Roche Inc. 7-Chloro-5-(2-fluorophenyl)-1-(2-hydroxyethyl)-1,3-dihydro -2H-1,4-benzodiazepin-2-one and esters thereof. 3,819,602, Cl. 260-239.30d.
Fuji Electric Company Limited: *See—*
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Yamamoto, Nobuo; Nagao, Kameji; and Horie, Ikutaro, 3,819,608.
Fujii, Chiyuki; Sinike, Tsutomu; and Inoue, Yoshihau, to Denki Kagaku Kogyo K.K. Process for producing 1-chloro-1-fluoroethylene. 3,819,729, Cl. 260-653.300.
Fujii, Takeshi: *See—*
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Yamashita, Gentaro; Fujii, Takeshi; and Sakota, Koichiro, 3,819,695.
Fujimoto, Yasuo; and Koiwa, Yoichi. Process for saponifying polypeptides containing a unit of glutamic acid-gamma-ester using a mixture of alcohols in the presence of an alkaline metal hydroxide. 3,819,588, Cl. 260-78.00a.
Fujino, Masahiko: *See—*
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Fujio, Yoshio, to Mitsubishi Denki Kabushiki Kaisha. Data recording and reproducing system. 3,819,874, Cl. 179-100.30a.
Fujisawa Pharmaceutical Co., Ltd.: *See—*
Morimoto, Akira; Kariyone, Kazuo; Kurita, Masaru; Hashimoto, Masashi; and Nishiwaki, Osamu, 3,819,621.
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Fujita, Keiichi, to Kabushiki-Kaisha Tokai-Rika-Denki-Seisakusho. Rod end cold forming process. 3,818,746, Cl. 72-356.000.

Fujiwara, Motozo: *See—*
Ono, Katsuya; Fujiwara, Motozo; Tabe, Norihiko; and Kawahito, Norihiko, 3,819,792.

Fukazawa, Nobuo: *See—*
Aya, Masahiro; Kishino, Shigeo; Kudamatsu, Akio; Fukazawa, Nobuo; Kume, Toyohiko; and Shiokawa, Kozo, 3,819,754.

Fukuda, Shuzo: *See—*
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Fukumura, Masayuki: *See—*
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Fukuoka, Toshimi, to Sony Corporation. Excess voltage protecting circuit. 3,819,986, Cl. 317-16.000.

Fukuyama, Takahiko: *See—*
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Fulton, Douglas William: *See—*
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Fumagalli, Giovanni. Pumping device for promoting patients breathing. 3,818,806, Cl. 92-13.200.

Funk, Paul M.; Legg, Billy J.; and Baldwin, Richard W., to Monsanto Company. Polyester esterification under two different pressures. 3,819,585, Cl. 260-75.00m.

Fushida, Yoshio; Suzuki, Kazuo; Kasahara, Kakaaki; Okawa, Kazuyoshi; and Ashizawa, Masayoshi, to Kurosawa Tele-Communications Limited. Apparatus for determining the position of print by using a transducer. 3,819,025, Cl. 197-1.00r.

Fuss, Fritz, to Fritz Fuss K.G. Electric door opener. 3,819,215, Cl. 292-201.000.

Gaeth, Rudolf: *See—*
Stastny, Fritz; Trieschmann, Hans-Georg; and Gaeth, Rudolf, 3,819,543.

GAF Corporation: *See—*
Barabas, Eugene S., 3,819,559.
Radin, Edward J., 3,819,260.
Yamashita, Kinzo T.; Graham, David E.; and Welch, Eldred, 3,819,680.

Gaiser, Robert F., to Bendix Corporation, The. Master cylinder with resiliently separated primary and secondary pistons. 3,818,706, Cl. 60-562.000.

Galantay, Eugene E., to Sandoz-Wander, Inc. 6-[2-(3-Hydroxyalkyl)-3,5-disubstitutedphenyl] hexanoic acids and salts thereof. 3,819,694, Cl. 260-521.00r.

Gale, David M., to Du Pont de Nemours, E. I., and Company. 2-Alkoxy-1-substituted cyclobutenes and process therefor. 3,819,677, Cl. 260-464.000.

Galiano, Francis R.; Kellum, Gene E.; King, Terry R.; and Rankin, David, to Gulf Research & Development Company. Catalyst composition for the polymerization of olefins. 3,819,598, Cl. 260-94.90d.

Gamber, William N.: *See—*
Foxworthy, Eugene R.; Blatter, Albert; Gamber, William N.; Presley, Rex W.; and Verge, Kenneth W., 3,819,135.

Gandhi, Haren S.: *See—*
Dalla, Betta, Ralph A.; Gandhi, Haren S.; Kummer, Joseph T.; and Shelef, Mordecai, 3,819,536.

Gardetto, John J.: *See—*
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Gardisette GmbH, Firma: *See—*
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Gardner, John Nicholson, to Hoffmann-La Roche Inc. Reduction of sulfones. 3,819,652, Cl. 260-332.800.

Gardner, Orian R. Burner for light combustible materials. 3,818,848, Cl. 110-18.00r.

Garner, Derek H.; Bosworth, George H.; and Barton, George C., to USM Corporation. Pulling and lasting machines. 3,818,526, Cl. 12-10.100.

Garrett, William R., to Smith International, Inc. Wall contacting tool. 3,818,999, Cl. 175-325.000.

Gartner, Klaus-Jurgen: *See—*
Brixy, Heinz; and Gartner, Klaus-Jurgen, 3,818,761.

Gaudette, Walter M., Jr.; and Trimble, Philip K., to General Motors Corporation. Internal combustion engine ignition timing instrument. 3,820,013, Cl. 324-16.00r.

Gaullier, Pierre, to U.S. Philips Corporation. Shutter for photographic camera. 3,820,145, Cl. 354-250.000.

Gayler, Ronald: *See—*
Aitken, Ian Donald; Gayler, Ronald; Grover, John Roger; and Spencer, Raymond Anthony Philip, 3,819,056.

Gearheart, John D.; and Takenaka, George, to Addmaster Corporation. Perforated tape reader. 3,819,912, Cl. 235-61.11e.

Gebauer, Hans, to Hoesch Maschinenfabrik Deutschland AG. Method and apparatus for producing welded spiral seam pipe. 3,818,740, Cl. 72-203.000.

Gebr. Bohler & Co., AG: *See—*
Korntheuer, Friedrich, 3,819,950.

Gebruder Buhler AG: *See—*
Eggenberger, Ulrich; and Zehnder, Josef, 3,819,774.

Gebrueder Buehler AG: *See—*
Espeel, Frans Joris, 3,818,940.

Geiger, Franklin O., to Farrington Business Machines Corporation. Recessed keyboard imprinter. 3,818,826, Cl. 101-45.000.

Gellekink, Bernard; and Clemens, Theodorus Albertus, to N. V. Hollands Signaalapparaten. Target take-over circuit. 3,820,113, Cl. 343-7.300.

General Dynamics Corporation: *See—*
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General Electric Company: *See—*
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Binder, John Frank, 3,819,967.
Butler, Walter J.; Barron, Mark B.; and Kurz, Bruno, 3,819,954.
De Hollander, William R., 3,819,804.
Evans, Robert C.; and Hehmann, Horst W., 3,819,008.
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Puckette, Charles McD., 3,820,051.
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General Tire & Rubber Company, The: *See—*
Ayers, Myron T., 3,819,791.

Genson, Samuel Richard, to Johns-Manville Corporation. Apparatus for winding strand material. 3,819,122, Cl. 242-18.00r.

Geonnotti, Anthony R. Holding and locating fixture for carbide throwaway inserts. 3,818,647, Cl. 51-218.00r.

Georg, Karl: *See—*
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Georges, Andre Henri Eugene: *See—*
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Gerber Scientific Instrument Company, The: *See—*
Rich, Leonard G.; and Gerber, Heinz Joseph, 3,820,121.

Gerbetz, William. Chromatic harmonica rack. 3,818,792, Cl. 84-379.000.

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Gerisch, Gunther: *See—*
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Gesek, Rudolf; Fadler, Walter; and Bohn, Georg. Method and furnace for maintaining the temperature level of metal melts. 3,819,842, Cl. 13-27.000.
Gesellschaft fur Kernorschung mbH: *See—*
Schmidt, Hans; Eggert, Erwin; and Schuckle, Gert, 3,819,420.
Gewartowski, James Walter; and Tatsuguchi, Isamu. Resonance control in interdigital capacitors useful as DC breaks in diode oscillator circuits. 3,820,041, Cl. 333-1.100.
Gewerkschaft Eisenhutte Westfalia: *See—*
Lobbe, Armin, 3,818,713.
Gibbons, Harry L. Quick connect terminal apparatus and device for providing terminals and splices on coaxial cable leads. 3,820,059, Cl. 339-100.000.
Gibson, Van A. Protective cage for trench workers. 3,818,709, Cl. 61-41.00a.
Giddings & Lewis, Inc.: *See—*
Zettler, William D., 3,818,797.
Giebler, Fritz; Moder, Hans-Ulrich; Rabold, Jurgen; and Schaffer, Bernhard. Method for testing units of a program controlled data processing system. 3,820,077, Cl. 340-172.500.
Gieskieng, Marion W. Method and apparatus for the detection of cracks and flaws in rail wheels, rails and the like by sliding a prerecorded magnetic medium over the test piece. 3,820,016, Cl. 324-37.000.
Giesselmann, Gunter; Monch, Heinz; Schreyer, Gerd; and Weiberg, Otto, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Recovery of hydrogen peroxide from an aqueous solution by distillation with organic extractants. 3,819,818, Cl. 423-588.000.
Giglia, Robert Domenico, to American Cyanamid Company. Additives that increase the stability of electrochromic films in electrochromic devices. 3,819,252, Cl. 350-160.00r.
Gil-Castillo, Arturo. Removable denture connection. 3,818,594, Cl. 32-5.000.
Gilbert, Horace E.: *See—*
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Gilbo, Charles F.: *See—*
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Gillette Company, The: *See—*
Fischer, Ernest John, 3,818,600.
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Beckmann, Georg; and Gilli, Paul Viktor, 3,818,698.
Gilli, Paul Viktor, to Waagner-Biro A.G. Power plant and method for generating peak power therein. 3,818,697, Cl. 60-94.00a.
Gindrup, Wayne; and Siegmund, Alfred J., Jr., to Napko Corporation. Rapid curing powdered coating composition. 3,819,564, Cl. 260-37.0ep.
Giner, Jose: *See—*
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Girling Limited: *See—*
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Bozzato, Giuliano; Pesaro, Mario; Schudel, Peter; Hug-Inderbitzin, Marianne; and Erickson, Robert Edward, 3,819,711.
Lamparsky, Dietmar; and Schudel, Peter, 3,819,712.
Glanville, Lewis Malcolm; and Dunkley, Anthony F. M., to International Synthetic Rubber Company Limited, The. Adhesive composition. 3,819,552, Cl. 260-27.0bb.
Glanzstoff AG: *See—*
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Glaser, Hermann: *See—*
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Glass Container Manufacturers Institute, Inc.: *See—*
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Glass, Marvin, & Associates: *See—*
Meyer, Burton C., 3,818,916.
Glassey, Stephen F., to Caterpillar Tractor Company. Isochronous governor. 3,818,883, Cl. 123-140.00r.
Glatt, Werner. Apparatus for producing a fluidized bed and for spraying a fluid upon the whirling particles. 3,818,605, Cl. 34-57.00a.
Glaverbel S.A.: *See—*
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Cowley, Brian Richard; Graham, William; Humber, David Cedric; Wetherill, Aubrey; and White, William James, 3,819,622.
Gliddon, E. Barton: *See—*
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Glomski, Ronald L.; and Jones, Allen H., Jr., to Dow Chemical Company, The. Hydroxyethylmethylcellulose as a protective colloid in vinylacetate emulsion polymerization. 3,819,593, Cl. 260-86.10e.
Go, Ting Sin, to Petrolite Corporation. Use of alkylene polyamines in distillation columns to control corrosion. 3,819,328, Cl. 21-2.50r.
Godtfredsen, Wagn Ole: *See—*
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Goebel, Franz: *See—*
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Gogarty, William B.; and Haws, Gerald W., to Marathon Oil Company. LPG micellar solutions as fracturing fluids. 3,818,993, Cl. 166-308.000.
Gold, Gerald: *See—*
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Goldfischer, Lester L., to Singer Company, The. Digital frequency tracker. 3,819,920, Cl. 235-152.000.
Goldsmith, Herbert: *See—*
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Goller, Ernst: *See—*
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Goode, Rexford Fenton. Golf training aids. 3,819,189, Cl. 273-183.00b.
Goodhouse, Carl J., to Robertshaw Controls Company. Cooking computer means. 3,819,112, Cl. 235-61.00a.
Goodinge, Mark Wallinger; and Shephard, Robert, to Plessey Handel und Investments A.G. Swirl passage fuel injection devices. 3,819,116, Cl. 239-102.000.
Goodrich, B. F., Company, The: *See—*
Karper, Paul W.; and Porter, John P., 3,818,751.
McRowe, Arthur W., 3,819,577.
Goodway, Inc.: *See—*
Santaella, F. Gregory, 3,819,172.
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Goodyear Tire & Rubber Company, The: *See—*
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Gormley, William T.; and Corson, Ben B., to Koppers Company, Inc. Isomerization of tetrahydrophthalic anhydride. 3,819,658, Cl. 260-346.300.
Goscenski, Edward J., Jr., to Eaton Corporation. Differential gear mechanism. 3,818,781, Cl. 74-711.000.
Gosney, William Milton, to Texas Instruments, Incorporated. Charge transfer device analog matched filter. 3,819,958, Cl. 307-304.000.
Gothard, Nicholas. Methods of and apparatus for separating solid and liquid particles from air and other gases. 3,818,678, Cl. 55-13.000.
Gottlieb, C. Robert: *See—*
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Gouedy, Lucien L. Maritime day shapes and display system therefor. 3,818,857, Cl. 116-132.00r.
Gough, Stanley T. D., to Mobil Oil Corporation. Tobacco sucker control with dialkyl 1,2,5-thiadiazol-3-yl phosphates. 3,819,354, Cl. 71-78.000.
Gould, Robert R., Jr., to General Motors Corporation. Domestic range control and display system. 3,819,906, Cl. 219-506.000.
Grace, W. R., & Co.: *See—*
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Granley Products (London) Limited: *See—*
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Grasselli, Robert K.; and Suresh, Dev D., to Standard Oil Company, The. Preparation of esters from unsaturated aldehydes and alcohols. 3,819,685, Cl. 260-486.00r.
Grassl, Marianne: *See—*
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Graves, Charles A.; and Sopchak, Peter, to Allied Chemical Corporation. Process for the preparation of soda ash from trona ore. 3,819,805, Cl. 423-206.000.
Gray, Theodore F., Jr.: *See—*

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Greavu, Nicolae: *See—*
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Green, Joseph, to Cities Service Company. Flame retardant compositions. 3,819,575, Cl. 260-45.75r.

Green, Robert Leonard, to Granley Products (London) Limited. Testing device. 3,820,114, Cl. 343-17.700.

Green, Stanley, to Lucas, Joseph, (Industries) Limited. Vehicle lamps. 3,819,931, Cl. 240-103.00r.

Greenaway, David Leslie, to RCA Corporation. Identification card decoder. 3,819,911, Cl. 235-61.11e.

Greenwald, Robert J. Fecal examination device. 3,819,045, Cl. 209-17.000.

Greenwood, Kurt, to United Kingdom of Great Britain and Northern Ireland, Secretary of State for Defence in Her Britannic Majesty's Government of the. Jet operated weaving machine. 3,818,951, Cl. 139-127.000.

Gregersen, Jack K.: *See—*
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Greiwe, Daniel L.: *See—*
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Grevich, John J.; and Gardetto, John J., to Domain Industries, Inc. Tube holder. 3,819,194, Cl. 279-23.000.

Grimm, Peter: *See—*
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Griner, Arthur J., to Nabisco, Inc. High speed wrapping machine. 3,818,675, Cl. 53-133.000.

Griselli, Pier Luigi: *See—*
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Grob, Ernst: *See—*
Grob, Ernst; and Krapfenbauer, Hans, 3,818,735.

Grob, Ernst; and Krapfenbauer, Hans, to Grob, Ernst. Roller head for cold rolling of splined shafts or gears. 3,818,735, Cl. 72-78.000.

Groenendaal, Arnoldus Adrianus Maria: *See—*
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Groppel, Dieter: *See—*
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Gross, James R., to Dow Chemical Company, The. Homopolymers of isopropenyl alkyl ethers. 3,819,596, Cl. 260-91.10m.

Groszek, Aleksander Jerzy: *See—*
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Grover, John Roger: *See—*
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Groves, Harold W. Segmented ski apparatus including antivibration coupling means. 3,819,198, Cl. 280-11.13k.

Grubb, Willard T.; and Cliche, Carl E., to General Electric Company. Electrochemical cell with inside layer of water-swellable polymer. 3,819,416, Cl. 136-86.00r.

Gruendinger, Johann. Potentiometer. 3,820,052, Cl. 338-97.000.

Gruenke, Roger A.: *See—*
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Grumbach, Pierre, to La Cellophane. Extruded plastic films and method for forming the same. 3,819,788, Cl. 264-89.000.

Grundy, Reed H., to Westinghouse Air Brake Company. Detector track circuit for railroad crossings. 3,819,933, Cl. 246-114.000.

Grunwald, John J.; Rhodenizer, Harold L.; and Slominski, Leo J., to MacDermid Incorporated. Electroless and electrolytic copper plating. 3,819,497, Cl. 204-15.000.

Gruppo Lepetit S.p.A.: *See—*
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GTE Automatic Electric Laboratories, Incorporated: *See—*
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GTE Information Systems Incorporated: *See—*
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GTE Laboratories Incorporated: *See—*
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GTE Sylvania Incorporated: *See—*
Roche, William J., 3,819,970.

Guarnaschelli, Gianpiero, to Honeywell Information Systems Italia. Driving circuit for switching transistor. 3,820,008, Cl. 323-17.000.

Guczoghy, Lajos: *See—*
Puklics, Maria; Guczoghy, Lajos; Matolcsy, Gyorgy; and Bodnar, Janos, 3,819,609.

Guerci, Carlo: *See—*
Pagella, Elio; and Guerci, Carlo, 3,818,643.

Guidotti, Alfred E.: *See—*
Parsons, Robert A.; and Guidotti, Alfred E., 3,819,465.

Guigan,Jean. Selective dispensing of stored articles. 3,819,088, Cl. 221-224.000.

Gulf & Western Industries, Inc.: *See—*
Flumignan, Dennis P.; and Flanigan, William J., 3,819,894.

Gulf Research & Development Company: *See—*
Barie, Walter P., Jr.; Franke, Norman W.; and Paviak, Stanley C., 3,819,656.
Clampitt, Bert H.; Harwell, Kenneth E.; and Jones, Joseph W., Jr., 3,819,514.
Galiano, Francis R.; Kellum, Gene E.; King, Terry R.; and Rankin, David, 3,819,598.
Paviak, Stanley C., 3,819,540.

Gunderman, Anthony J.; and Forshay, Richard D., to Avon Products, Inc. Transparent candle. 3,819,342, Cl. 44-7.500.

Gunn, Sidney W.: *See—*
Coale, Thomas E.; Gunn, Sidney W.; Merrigan, Frank; and Tompkins, Donald M., 3,818,832.

Gunter Wachtler: *See—*
Hinterstocker, Adolf, 3,819,186.

Gunther, Stefan: *See—*
Haberrecker, Klaus; and Gunther, Stefan, 3,819,968.

Guttag, Alvin, to Weston Chemical Corporation. Polymers stabilized with trimethylol propane phosphites. 3,819,571, Cl. 260-45.80r.

Gutte, Richard: *See—*
Dalibor, Horst; Gutte, Richard; and Stenzel, Gunter, 3,819,447.

Gyulavari, Imre: *See—*
Praznovsky, Istvan; and Gyulavari, Imre, 3,819,512.

Haberrecker, Klaus; and Gunther, Stefan, to Siemens Aktiengesellschaft. Rotary anode for X-ray tubes. 3,819,968, Cl. 313-60.000.

Habisohn, Victor J., to Power Electronics International, Inc. Multiple speed motor control system. 3,819,996, Cl. 318-224.000.

Hadam, Wilhelm: *See—*
Bauknecht, Gunter; Hadam, Wilhelm; and Ploppa, Jurgen, 3,820,082.
Kazmeier, Gunther; and Hadam, Wilhelm, 3,818,726.

Hadam, Wilhelm; and Goller, Ernst, to Stoll, H., and Company. Apparatus for controlling the movements of a flat knitting machine. 3,818,727, Cl. 66-127.000.

Hadley, Richard M.: *See—*
McIntyre, Matthew; and Hadley, Richard M., 3,818,780.

Hadnagy, Thomas D.; and Goldberg, Arthur. Chemical injection system. 3,819,298, Cl. 417-44.000.

Hadni, Armand; and Thomas, Robert, to Agence Nationale de Valorisation de la Recherche (Anvar). Ferroelectric memories, and method of activating the same. 3,820,088, Cl. 340-173.200.

Haffner, Donald G.; Woelffer, Neill C.; and Wuerker, Charles A., to Jacobsen Manufacturing Company. Lawn mower propelling drive. 3,818,686, Cl. 56-11.100.

Hague, Wilmer W., to Chambersburg Engineering Company. Control system for an impact device. 3,818,799, Cl. 91-40.000.

Hahn, Carl, Dr., KG.: *See—*
Etz, Herbert, 3,818,912.

Halasa, Adel F., to Firestone Tire & Rubber Company, The. Process for the grafting of styrene onto polymeric butadiene or isoprene prereacted with an alkyl lithium or sodium and a sec-alkyl. 3,819,764, Cl. 260-877.000.

Hale, Elgie J., to Kratos. Electronic device for determining the height, width, length and volume of a container. 3,819,918, Cl. 235-151.300.

Hall, John S.: *See—*
Butts, Ernest O.; and Hall, John S., 3,819,143.

Hall, Roger D.; and Johnson, Robert P., to Bendix Corporation, The. Frequency extension of circularly polarized antenna. 3,820,117, Cl. 343-802.000.

Hall, Roger D., to Bendix Corporation, The. Antenna and interface structure for use with radomes. 3,820,118, Cl. 343-872.000.

Halliburton Company: *See—*
Coulter, Gerald R., 3,818,990.
McKinley, Ronnie Jack, 3,820,029.

Halliday, Adam T.: *See—*
Bushaw, Wayne; Halliday, Adam T.; Mukavitz, David R.; and Loan, Richard L., 3,819,362.

Hallon, Joseph R., Jr.: *See—*
Kurtz, Anthony D.; Gravel, Charles L.; and Hallon, Joseph R., Jr., 3,819,431.

Halpern, Melvin A.: *See—*
St. Pierre, Richard; and Halpern, Melvin A., 3,818,863.

Hamanaka, Ernest S., to Pfizer Inc. α-Carboxamido acyl derivatives of penicillin. 3,819,600, Cl. 260-239.100.

Hambro Structural Systems Limited: *See—*
Butts, Ernest O.; and Hall, John S., 3,819,143.

Hamburger, Brigitte: *See—*
Kuhle, Engelber; Klauke, Erich; Hammann, Ingeborg; Hamburger, Brigitte; and Frohberger, Paul-Ernst, 3,819,684.

Hamilton, James O., III: *See—*
Bergh, Arndt B.; Forbes, Bert E.; Hamilton, James O., III; and Mixsell, Joseph C., Jr., 3,820,079.

Hammann, Ingeborg: *See—*
Draber, Wilfried; Buchel, Karl-Heinz; Hammann, Ingeborg; and Frohberger, Paul-Ernst, 3,819,703.
Kuhle, Engelber; Klauke, Erich; Hammann, Ingeborg; Hamburger, Brigitte; and Frohberger, Paul-Ernst, 3,819,684.
Lorenz, Walter; Boshagen, Horst; Hammann, Ingeborg; and Behrenz, Wolfgang, 3,819,644.

Riebel, Hans-Jochem; Brokmeier, Dieter; and Hammann, Ingeborg, 3,819,753.
Zumach, Gerhard; Siegle, Peter; Hammann, Ingeborg; and Frohberger, Paul-Ernst, 3,819,649.
Zumach, Gerhard; Kuhle, Engelbert; Behrenz, Wolfgang; and Hammann, Ingeborg, 3,819,682.

Hammond, Ivan K. Heat treating apparatus. 3,819,067, Cl. 214-26.000.

Hamrick, Harold Escar, to Bell Telephone Laboratories, Incorporated. Mobile telephone cellular switching system. 3,819,872, Cl. 179-41.00a.

Hans, Rainer: *See—*
Cremer, Dieter; and Hans, Rainer, 3,818,759.

Hanyuda, Toshiaki: *See—*
Hokamura, Sadakazu; Akaoka, Teruhisa; and Hanyuda, Toshiaki, 3,819,551.

Haratake, Yoshiharu, to Asahi Kogaku Kogyo Kabushiki Kaisha. Electrical systems for controlling camera shutters. 3,820,126, Cl. 354-24.000.

Hardy, William Arthur, to Lucas, Joseph, (Industries) Limited. Nut and gear assemblies for use in engine starter motors. 3,818,768, Cl. 74-6.000.

Harkness, Joseph R.; Santi, John D.; and Lechtenberg, Leo J., to Briggs & Stratton Corporation. Method of making an assembly of alternator magnet blocks with engine flywheel. 3,818,586, Cl. 29-598.000.

Harmon Industries, Inc.: *See—*
Ballinger, Forrest H.; Heggestad, Robert E.; and Olmsted, Leland W., 3,820,100.

Harnden, John D., Jr.: *See—*
Kornrumpf, William P.; and Harnden, John D., Jr., 3,819,938.

Harre, Aug., & Co.: *See—*
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Harrell, John W.: *See—*
Sexton, James H.; Patton, Bobbie J.; and Harrell, John W., 3,820,063.

Harrington, Phil R.: *See—*
Weber, Fred A.; Caputo, James P.; Eddy, John W.; Harrington, Phil R.; O'Toole, Gerald; Puccini, Sergio E.; and Adamski, Diane L., 3,819,865.

Harris, Abner G. Disposable syringe. 3,818,910, Cl. 128-232.000.

Harris, Derek James; and Firth, Jack, to CVS Chip Vending Services Limited. Fried product dispensing apparatus. 3,818,820, Cl. 99-407.000.

Harris Paint Company: *See—*
Ceffey, Charles A.; and Catena, Michael J., 3,819,119.

Harris, Ralph A.: *See—*
Carroll, Paul E.; and Harris, Ralph A., 3,819,864.

Harris, Robert F.: *See—*
Little, John C.; Teot, Arthur S.; and Harris, Robert F., 3,819,538.

Harris, Robert S.: *See—*
Dawson, Gary D.; and Harris, Robert S., 3,818,880.

Harris, Ronald, to Stibbe Machinery Limited. Multi-feed circular knitting machine having an improved patterning mechanism. 3,818,723, Cl. 66-50.00b.

Harris-Intertype Corporation: *See—*
Anderson, Frederick Douglas; and Reed, David Austin, 3,819,173.
Kolb, Edwin R., 3,819,854.

Harrison, Ian T.: *See—*
Pfister, Jurg R.; Harrison, Ian T.; and Fried, John H., 3,819,654.

Harrison, Thomas S., to Sterling Drug Inc. Dispenser pack for premoistened towelettes. 3,819,043, Cl. 206-449.000.

Harsco Corporation: *See—*
Reed, Edward A., 3,819,072.

Hart, Le Roy; Salonia, Thomas R.; and Bergen, Gary R., to Emhart Corporation. Cylindrical lock set. 3,819,214, Cl. 292-169.130.

Hartley, Frederick J.: *See—*
Foster, Michael R.; and Hartley, Frederick J., 3,818,701.

Hartner, Leo: *See—*
Assmus, Friedrich; Flaig, Hans; Dietrich, Dieter; and Hartner, Leo, 3,820,105.

Hartter, Donald R.: *See—*
Benderly, Asaf A.; and Hartter, Donald R., 3,819,415.

Hartzell, Donald Joseph: *See—*
Rollins, Forrest Theodore; Kubovich, Frank Steve; Buess, Kenneth Benning; and Hartzell, Donald Joseph, 3,818,673.

Harwell, Kenneth E.: *See—*
Clampitt, Bert H.; Harwell, Kenneth E.; and Jones, Joseph W., Jr., 3,819,514.

Hasama, Yoshifumi; and Ito, Ryoichi, to Mitsubishi Petrochemical Co., Ltd. Process for preparing molded polyolefin foam. 3,819,784, Cl. 264-54.000.

Hasbro Industries, Inc.: *See—*
Cederholm, Carl E., 3,818,631.

Hasegawa, Toru; Henmi, Teruji; Kamiya, Takaaki; and Iwasaki, Hidesuke, to Takeda Chemical Industries, Ltd. Antibiotic-T-24146 and process for preparing same. 3,819,835, Cl. 424-122.000.

Hashimoto, Masashi: *See—*
Morimoto, Akira; Kariyone, Kazuo; Kurita, Masaru; Hashimoto, Masashi; and Nishiwaki, Osamu, 3,819,621.

Haskon Incorporated: *See—*
Higginbotham, Lloyd D., 3,819,317.

Hastwell, Peter J.; and Gliddon, E. Barton, to Savin Business Machines Corporation. Regulated power supply for corona charging unit. 3,819,942, Cl. 250-324.000.

Hata, Yasuo; and Shuto, Yasusuke, to Idemitsu Kosan Co., Ltd. Process for preparing thermoplastic elastomer. 3,819,766, Cl. 260-879.000.

Hatlevoll, Jens Bugge; Jordal, Per; and Sivertsen, Georg Sigurd, to A/S Ardal og Sunndal Verk. Crust breaking machine. 3,819,144, Cl. 299-37.000.

Hattenbrun, David L., to Avon Products, Inc. Cosmetic cleansing preparation. 3,819,525, Cl. 252-132.000.

Hauck Manufacturing Company: *See—*
Schreter, Robert E., 3,819,319.

Haufe, Juergen: *See—*
Beck, Fritz; Sabelus, Guenther; Fischer, Roman; and Haufe, Juergen, 3,819,548.

Haugwitz, Rudiger Dieter; and Narayanan, Venkatachala Lakshmi, to Squibb, E. R., & Sons, Inc. Thiazolo(3,4-A)benzimidazoles. 3,819,618, Cl. 260-240.00f.

Hauser, Ambrose A.; Eckert, Terry T.; and McDonel, James D., to General Electric Company. Cooling slot for airfoil blade. 3,819,295, Cl. 416-97.000.

Hawken, Kenneth William, to Tektronix, Inc. Side-by-side dual gun CRT having horizontal deflector plates provided with side shields for correction of geometric distortion. 3,819,984, Cl. 315-27.0gd.

Hawker Siddeley Dynamics Limited: *See—*
Laws, Arthur Ernest, 3,819,940.

Hawley, George Thomas, to Bell Telephone Laboratories, Incorporated. Light coupled loop current detector. 3,819,866, Cl. 179-16.0aa.

Haws, Gerald W.: *See—*
Gogarty, William B.; and Haws, Gerald W., 3,818,993.

Hayakawa, Yoshihiro: *See—*
Onishi, Akira; Irako, Koichi; Iseda, Yutaka; Hayakawa, Yoshihiro; Kawagoe, Takahiro; and Miyamoto, Shoji, 3,819,590.

Hayashi, Masahiro: *See—*
Kajiwara, Toshiyuki; Sonobe, Noriyoshi; Nishi, Hidetoshi; and Hayashi, Masahiro, 3,818,743.

Hayashi, Takeshi; and Onuki, Masami, to Matsushita Electric Industrial Company, Limited. Thin-film capacitor and method for the fabrication thereof. 3,819,990, Cl. 317-258.000.

Hayman, Edgar S., Jr., to Amchem Products, Inc. Composition and method for inhibiting acid attack of metals. 3,819,527, Cl. 252-149.000.

Haynes, Benjamin O.: *See—*
Abrams, Harold B.; Haynes, Benjamin O.; and Williams, Glynn P., 3,820,080.

Haynos, Joseph G., to Communications Satellite Corporation. Mechanically interlaced and electrically interconnected silicon solar cells. 3,819,417, Cl. 136-89.000.

Haysom, Derek W. R.: *See—*
Wells, William; and Haysom, Derek W. R., 3,819,164.

Hayward, Christopher Frederick; and Smithers, Michael James, to Imperial Chemical Industries Limited. Process for the manufacture of polypeptides. 3,819,606, Cl. 260-112.500.

Health-Mor Inc.: *See—*
Martinec, Eugene F.; and Fairaizl, Max L., 3,818,540.

Heap, Alec John, to Lucas, Joseph, (Electrical) Limited. Automotive rotary switch with intermediate time delay means biasing a contact in non-operative position. 3,819,883, Cl. 200-11.00j.

Heap, James C., to Thrall Car Manufacturing Company. Rapid discharging hopper car door actuating mechanisms. 3,818,842, Cl. 105-240.000.

Heathwaite, Hewart H., to Borg-Warner Corporation. Drive system. 3,819,002, Cl. 180-32.000.

Hecker, Eugene L.: *See—*
Evans, Jesse L.; and Hecker, Eugene L., 3,818,890.

Hedges, Lee Minor, to Johns-Manville Corporation. Flexible and foldable conduit. 3,818,948, Cl. 138-119.000.

Hedges, Walter Paul, to Motorola, Inc. Communication system with portable units connected through a communication channel to a computer for applying information thereto. 3,819,862, Cl. 179-2.00a.

Hegedus, Walter J.: *See—*
Drummond, W. Wendell; and Hegedus, Walter J., 3,818,688.

Heggestad, Robert E.: *See—*
Ballinger, Forrest H.; Heggestad, Robert E.; and Olmsted, Leland W., 3,820,100.

Hehmann, Horst W.: *See—*
Evans, Robert C.; and Hehmann, Horst W., 3,819,008.

Heier, Jan; and Zoethout, Walterus Andreas, to U.S. Philips Corporation. Method of manufacturing dry aluminum capacitors, and capacitors obtained by their method. 3,819,340, Cl. 29-570.000.

Heimann, Egon. Folding box. 3,819,105, Cl. 229-39.00r.

Heindl, Joseph: *See—*
Von Szczepanski, Christoph; Heindl, Joseph; Schroder, Eberhard; Kessler, Hans-Joachim; and Redmann, Ulrich, 3,819,717.

Helly-Hansen A/S: *See—*
Albrecht, Gunnar, 3,818,507.

Helmer, Rupert C.; and Johnson, Alan C., to Val-Trac Manufacturing Co. Ltd. Draw track for drapes. 3,818,544, Cl. 16-94.00d.

Hemsath, Klaus H.; Vereecke, Frank J.; and Ferguson, Norman T., to Midland-Ross Corporation. Minimum scale reheating furnace and means relating thereto. 3,819,323, Cl. 432-138.000.

Henley, Thomas D.; and Reeves, Richard F., to Amchem Products, Inc. Process for treating wastes containing chromates and/or complex iron cyanides. 3,819,051, Cl. 210-50.000.

Henmi, Teruji: *See—*

Hasegawa, Toru; Henmi, Teruji; Kamiya, Takaaki; and Iwasaki, Hidesuke, 3,819,835.
Moguro, Kanji; Miyano, Hiroshi; Kuwada, Yutaka; Henmi, Teruji; and Yamano, Togo, 3,819,634.
Henningsen, Erik: *See—*
Pharris, John A.; and Henningsen, Erik, 3,819,779.
Henrich, Charles T.; and Pierce, John M. Eddy current type digital encoder and position reference. 3,820,110, Cl. 340-347.00p.
Henriquez, Theodore A.: *See—*
Ivey, Larry E.; and Henriquez, Theodore A., 3,819,962.
Her Majesty the Queen in right of Canada, Minister of National Defence: *See—*
Slaght, William F., 3,819,863.
Herbert, James Frederick, to Metal Closures Limited. Closure sealing machines. 3,818,677, Cl. 53-338.000.
Hermann Finckh Metalltuch-und Maschinenfabrik: *See—*
Holz, Emil, 3,819,474.
Hermes Electronics Limited: *See—*
Starkey, Bertrand J., 3,818,524.
Herold, Wolfgang: *See—*
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Herring, Peter C.: *See—*
Rush, Michael M.; Subers, John E., Jr.; and Herring, Peter C., 3,819,855.
Hershire, Kent M., to E-Z Read Metric Rule, Inc. Measuring device. 3,818,598, Cl. 33-161.000.
Herzog, Stanley: *See—*
Levine, Irving E.; Huckins, Harold A.; and Herzog, Stanley, 3,819,663.
Hess, Kenneth L. Waterproof signal light for boat trailers. 3,819,926, Cl. 240-7.10r.
Hessert, James E., to Phillips Petroleum Company. Method of reducing lost circulation during well drilling. 3,818,998, Cl. 175-72.000.
Hesston Corporation: *See—*
Stoessel, Hermann V.; and Kountz, Jack M., 3,818,685.
Heuser, Leon John; and Anderson, Carl Francis, to Squibb, E. R., & Sons, Inc. Method for producing peptides by reaction of amino acid N-carboxyanhydrides with Schiff's bases. 3,819,607, Cl. 260-112.500.
Hewlett-Packard Company: *See—*
Holden, Thomas E., 3,820,061.
Hexcel Corporation: *See—*
Taylor, Robert S., 3,819,439.
Heyman Manufacturing Company: *See—*
Jemison, William, 3,819,139.
Hice, Jack O., Sr., to Vari-Phase, Inc. Apparatus for processing food. 3,818,818, Cl. 99-330.000.
Hies, Rudolf: *See—*
Kloda, Herbert; and Hies, Rudolf, 3,818,824.
Higbee, David A.: *See—*
Huber, Richard O.; Higbee, David A.; and Young, John W., 3,819,145.
Higginbotham, Lloyd D., to Haskon Incorporated. Apparatus for blow molding and injection cooling gas. 3,819,317, Cl. 425-387.00b.
Higgins, William Albert; and Ehren, Irwin Robert, to Lubrizol Corporation, The. Rheology modifiers for inks. 3,819,386, Cl. 106-27.000.
Higuchi, Akiyoshi: *See—*
Kinase, Kadeo; Higuchi, Akiyoshi; and Inokuma, Akira, 3,819,011.
Hilbert, Francis H. Counter circuit using current source. 3,819,955, Cl. 307-225.000.
Hilgemann, Hans, to Four Agenturer AB, mesne. Heat exchange system. 3,818,979, Cl. 175-21.000.
Hillberg, Ernest T.; and Isenberg, Lionel, to Rockwell International Corporation. Insulated tank base and insulated block. 3,818,664, Cl. 52-309.000.
Himeno, Shohachi, to Conde Kabushiki Kaisha. Knife for peeling off stickers and the like. 3,818,592, Cl. 30-151.000.
Himmelsbach, Paul; and Faller, Werner, to Schneider, Jos., & Co., Optische Werke Kreuznach. Mechano-optical digital position-indicating system with vernier reading. 3,820,096, Cl. 340-204.000.
Hinterstocker, Adolf, to Gunter Wachtler. Automatic electronic gaming machine of the roulette type. 3,819,186, Cl. 273-138.00a.
Hinz, Henry: *See—*
Ensmann, Burt; and Hinz, Henry, 3,818,628.
Hirano, Reiji: *See—*
Niizawa, Yoshiaki; Hirano, Reiji; and Ito, Matsutoshi, 3,820,107.
Hirsch, Jack, to Automatic Incinerator Correction Corporation. Wet scrubber. 3,818,683, Cl. 55-223.000.
Hirschfeld, Tomas, to Block Engineering, Inc. Blood cell analyzer. 3,819,270, Cl. 356-39.000.
Hirshfeld, Amiram: *See—*
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Hiruma, Eikyu: *See—*
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Hitachi, Ltd.: *See—*
Hosho, Yukio; and Atago, Takeshi, 3,818,881.
Kajiwara, Toshiyuki; Nishi, Hidetoshi; and Sonobe, Noriyoshi, 3,818,737.
Kajiwara, Toshiyuki; Sonobe, Noriyoshi; Nishi, Hidetoshi; and Hayashi, Masahiro, 3,818,743.
Ohta, Kazuo; Kurita, Kentaro; and Morita, Shigeru, 3,820,048.
Ho, Irving T.; and Maley, Gerald A., to International Business Machines Corporation. Read only memory (ROM) superimposed on read/write memory (RAM). 3,820,086, Cl. 340-173.0ff.
Hobbins, James F.: *See—*
Hurst, George H.; and Hobbins, James F., 3,819,153.
Hochschild, Richard. Composition of methionine with 2-dimethylamino-ethanol. 3,819,480, Cl. 195-1.800.
Hoehn, Wolfgang: *See—*
Schilling, Harald; and Hoehn, Wolfgang, 3,820,007.
Hoesch Maschinenfabrik Deutschland AG: *See—*
Gebauer, Hans, 3,818,740.
Hofer, Kurt; and Tscheulin, Guenther, to Sandoz Ltd.; a/k/a Sandoz AG. Organophosphorus benzofuran and benzothiophene compounds. 3,819,650, Cl. 260-329.300.
Hoffman, Arnold, to Polaroid Corporation. Relief images. 3,819,375, Cl. 96-35.000.
Hoffmann-La Roche Inc.: *See—*
Brossi, Arnold; Focella, Antonino; and Teitel, Sidney, 3,819,725.
Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, 3,819,655.
Fryer, Rodney Ian; and Sternbach, Leo Henryk, 3,819,602.
Gardner, John Nicholson, 3,819,652.
Hogg, Dallas John Arthur: *See—*
O'Brien, John Leslie; Finnimore, Bryan; and Hogg, Dallas John Arthur, 3,818,862.
Hogg, Derek, to Dunlap Limited. Apparatus for use in mounting tires on and removing tires from wheel rims. 3,818,968, Cl. 157-1.240.
Hogg, Walter R.: *See—*
Doty, Edward N.; and Hogg, Walter R., 3,820,020.
Doty, Edward Neal; and Hogg, Walter R., 3,820,019.
Hoggan, Daniel H. Lettering guide having double clip. 3,819,251, Cl. 350-121.000.
Hogstrom, Edwin F., to Nordson Corporation. Method and apparatus for applying wax to can ends. 3,819,403, Cl. 117-105.00a.
Hogue, Earl F.; and Katch, Richard P., to Romel Distributors, Inc. Ring plug. 3,818,621, Cl. 40-2.000.
Hokamura, Sadakazu; Akaoka, Teruhisa; and Hanyuda, Toshiaki, to Showa High Polymer Co., Ltd. Method for curing unsaturated epoxy-ester resinous compositions using an organic imide to control pot-life. 3,819,551, Cl. 260-23.0ep.
Hokanson, Elmer N.: *See—*
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Hokko Chemical Industry Co., Ltd.: *See—*
Takahashi, Saburo; Oyama, Hiroshi; Naka, Hiroshi; Yamamoto, Takaji; Nakatomi, Kentaro; Ishibe, Kouichi; and Saito, Toshihiro, 3,819,701.
Holcombe, Edward L.: *See—*
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Holden, Thomas E., to Hewlett-Packard Company. Connector for printed circuit boards. 3,820,061, Cl. 339-252.000.
Holk, Albert J., Jr., to Continental Can Company, Inc. Safety edge easy opening container. 3,819,083, Cl. 220-54.000.
Holland, Kenneth C., to Tektronix, Inc. Cascade 50 OHM attenuator system having removably mounted attenuator devices. 3,820,044, Cl. 333-81.00a.
Holleman, William Homer; and Weiss, Larry James, to Abbott Laboratories. Anticoagulant isolation from pit viper using a modified agarose bed and eluting with a benzamidine solution. 3,819,605, Cl. 260-112.00r.
Hollender, Anders K. Y., to Castenfors, Hugo. Syringe appliance. 3,819,091, Cl. 222-327.000.
Holman, George B., Jr.: *See—*
Jones, Loyd W.; and Holman, George B., Jr., 3,819,520.
Holmes, David Alan; and Fasig, Edgar William, Jr., to Du Pont de Nemours, E. I., and Company. Tetrafluoroethylene fine powder resin of a copolymer of tetrafluoroethylene and perfluoro (alkyl vinyl ether). 3,819,594, Cl. 260-87.50a.
Holmstrom, Fred E.: *See—*
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Holstrom, Geoffrey B.: *See—*
Egan, Dale W.; Holstrom, Geoffrey B.; Lord, Harry C.; Stevens, Robert W.; Port, Darrell P.; and Howard, Rollen D., 3,819,945.
Holt, David M.: *See—*
Williams, Robert A.; and Holt, David M., 3,820,023.
Holz, Emil, to Hermann Finckh Metalltuch-und Maschinenfabrik. Endless sieve belt draining device for paper machines. 3,819,474, Cl. 162-313.000.
Homan, William N.; Schuder, Maurice E.; and Stafford, Richard W., to Mallory, P. R., & Co., Inc. Cam-operated timer with rotary switch means including movable contacts on the cam. 3,819,886, Cl. 200-38.00b.
Homeyer, Bernhard: *See—*
Tarnow, Horst; Sasse, Klaus; Homeyer, Bernhard; and Wolfgang, Behrenz, 3,819,755.
Honda, Kazutoshi: *See—*
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Honeywell Inc.: *See—*
Kautz, Murrell F., 3,820,049.
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Honeywell Information Systems, Inc.: *See—*
Curley, John L.; Donahue, Thomas J.; Martland, Wallace A.; and Franklin, Benjamin S., 3,820,078.

Dunahue, Thomas J., 3,820,081.

Honeywell Information Systems Italia: *See*—
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Honjo, Mikio: *See*—
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Marumoto, Ryuji; Yoshioka, Yoshio; Kawazoe, Katsuyoshi; and Honjo, Mikio, 3,819,613.

Honma, Kiyoshi: *See*—
Sakuragawa, Yoshio; and Honma, Kiyoshi, 3,818,725.

Honnold, Fred V.; and Martin, William C., Jr., to Carrier Corporation. Fan construction. 3,819,294, Cl. 416-93.000.

Hoogeveen, Leonardus Petrus Johannes; and Butzelaar, Petrus Floris, to U.S. Philips Corporation. Device for detecting one or more oxidizable components in a sample. 3,819,499, Cl. 204-195.00s.

Hooghordel, Rijk: *See*—
Broekema, Gerhard Willem; and Hooghordel, Rijk, 3,819,978.

Hoover Company, The: *See*—
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Hope Kabushiki Kaisha: *See*—
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Hopkins, Walker L.: *See*—
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Hopper, Paul J.; Kleinpeter, Jack D.; and Milano, Dominic C., to Centinela Hospital Association, d/b/a Centinela Valley Community Hospital. Mobile hospital bed to facilitate X-ray examinations. 3,818,516, Cl. 5-67.000.

Hoque, Abul M. M.; and Cullen, Michael J., to Sperry Rand Corporation. Index-sector detection scheme for magnetic disc memory. 3,819,281, Cl. 360-52.000.

Hori, Saburo, to Kureha Kagaku Kogyo Kabushiki Kaisha. Process for thermally cracking hydrocarbons. 3,819,740, Cl. 260-679.00r.

Hori, Yasushi; and Shindou, Kesao, to Tokyo Shibaura Electric Co., Ltd. Automatic shut-off device for a tape recorder. 3,819,128, Cl. 242-189.000.

Horie, Ikutaro: *See*—
Yamamoto, Nobuo; Nagao, Kameji; and Horie, Ikutaro, 3,819,608.

Horii, Satoshi; Mizokami, Nariakira; Fujino, Masahiko; Shinagawa, Susumu; Ochiai, Michihiko; and Okutani, Tetsuya, to Takeda Chemical Industries, Ltd. N-isobornyloxy carbonylcephalo - sporin C. 3,819,619, Cl. 260-243.00c.

Horn, Robert; and Slovacek, Raymond J., to Torney Engineering Company. Crane load and radius indicating system. 3,819,922, Cl. 235-193.000.

Horn, Werner G.; and Neumann, Robert M., to Olin Corporation. Apparatus for forming multi-phase strip from particle and powder mixture. 3,819,311, Cl. 425-78.000.

Horton, William Howard, to Eastman Kodak Company. Shutter mechanism for flash and daylight mode operation. 3,820,138, Cl. 354-142.000.

Hosford, Alonzo L. Electroluminescent filament. 3,819,973, Cl. 313-498.000.

Hosho, Yukio; and Atago, Takeshi, to Hitachi, Ltd. Electrically controlled automatic choke of a carburetor for an internal combustion engine. 3,818,881, Cl. 123-119.00f.

Hosoe, Kazuya; Matsumoto, Seiichi; and Mochizuki, Noritaka, to Canon Kabushiki Kaisha. Focusing device for optical instruments. 3,820,129, Cl. 354-25.000.

Hosoki, Kanoo: *See*—
Yoshimura, Yoshio; Hosoki, Kanoo; Kurooka, Shigeru; and Iwamura, Kenichiro, 3,819,830.

Hosterman, Harry L., to Portage Newspaper Supply Company. Phototypesetting machine. 3,820,122, Cl. 354-15.000.

Hostettler, Paul: *See*—
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Houck, Albert: *See*—
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House, Ralph: *See*—
Sharman, Samuel H.; House, Ralph; and Anderson, Glen W., 3,819,519.

Houst, Douglas R.; and Jones, Kenneth R., to General Electric Company. Rotary lawn mower discharge chute safety deflector. 3,818,687, Cl. 56-320.200.

Houston Natural Gas Corporation: *See*—
Ebner, Theran L., 3,820,075.

Hoveman, Derek Charles, to International Standard Electric Corporation. Fluid immersion conductor insulation tester. 3,820,011, Cl. 324-54.000.

Howard, Anthony Stonham; and Johnson, Ivan Boris David. Liquid-contents gauging systems. 3,818,760, Cl. 73-291.000.

Howard, Rollen D.: *See*—
Egan, Dale W.; Holstrom, Geoffrey B.; Lord, Harry C.; Stevens, Robert W.; Port, Darrell P.; and Howard, Rollen D., 3,819,945.

Howe Furniture Corporation: *See*—
Burr, Alan Carleton, 3,818,844.

Howe, King Lau, to Du Pont de Nemours, E. I., and Company. Polymers of acrylonitrile and aromatic olefins which optionally contain grafted rubber. 3,819,762, Cl. 260-876.000.

Howell, William G.; Carpenter, Steve H.; and Otto, Henry E., to Esso Research and Engineering Company. Explosive welding of pipe with explosive means. 3,819,103, Cl. 228-3.000.

Huba, Francis; and Malkin, Irving, to Diamond Shamrock Corporation. Catalyst for oxidation of hydrocarbons and carbon monoxide. 3,819,535, Cl. 252-462.000.

Hubatsch, Gotthard, to Demag Aktiengesellschaft. Steel mill arrangement and improved converter construction and handling equipment for a steel mill. 3,819,161, Cl. 266-13.000.

Huber, Richard O.; Higbee, David A.; and Young, John W., to Armco Steel Corporation. Insert assembly for cast composite ingot. 3,819,145, Cl. 249-205.000.

Huber, William B., to Motorola, Inc. Indexing mechanism. 3,820,160, Cl. 360-106.000.

Huckins, Harold A.: *See*—
Levine, Irving E.; Huckins, Harold A.; and Herzog, Stanley, 3,819,663.

Hudson, Alma V. Frosting comb. 3,818,917, Cl. 132-116.000.

Hueber, Edward K., to Itak Corporation. Expandable spectacle case. 3,819,033, Cl. 206-5.000.

Huellmantel, Louis W.: *See*—
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Huffnagle, Clifton Wesley; and Wasserlein, Henry George, Jr., to AMP Incorporated. Multi-contact connector and contact terminal for flat cable. 3,820,055, Cl. 339-17.00f.

Hug-Inderbitzin, Marianne: *See*—
Bozzato, Giuliano; Pesaro, Mario; Schudel, Peter; Hug-Inderbitzin, Marianne; and Erickson, Robert Edward, 3,819,711.

Hughes, John Oliver Philip: *See*—
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Hughes, Ronald W.; Messick, Mikel Jay; and Volpe, John Rodgers, to Square D Company. Lockout means for thyristor firing circuit. 3,819,956, Cl. 307-254.000.

Humber, David Cedric: *See*—
Cowley, Brian Richard; Graham, William; Humber, David Cedric; Wetherill, Aubrey; and White, William James, 3,819,622.

Hummel, Lothar; and Kerl, Fritz, to Isco Optische Werke GmbH. Optical objective including a self-centering slide bearing. 3,819,254, Cl. 350-255.000.

Hunt, Robert F.: *See*—
Lee, Charles A.; and Hunt, Robert F., 3,819,475.

Hunter, Byron A., to Uniroyal, Inc. Foamable composition comprising a gas-expandable polymeric material and oxalyl carbazate or oligomers thereof, and method of foaming same. 3,819,545, Cl. 260-2.50r.

Hunter, Roger A.: *See*—
Stockton, Richard B.; Hunter, Roger A.; and Croy, Milton G., 3,819,873.

Huron Chemicals Limited: *See*—
Casson, Harold V.; Bennett, James S.; and Loftfield, Richard E., 3,819,503.

Hurst, George H.; and Hobbins, James F., to Hurst Performance, Inc. Rescue tool. 3,819,153, Cl. 254-93.00r.

Hurst Performance, Inc.: *See*—
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Hurtle, Richard La Verne: *See*—
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Hyde, LeRoy O. Gun scope rest device. 3,819,094, Cl. 224-1.00r.

Hydraulique B.G.: *See*—
Bertaux, Andre, 3,818,800.

Hydrocarbon Research, Inc.: *See*—
Weber, CArl L., 3,819,331.
Wolk, Ronald H.; and Rovesti, William C., 3,819,509.

Hydron, Inc.: *See*—
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Hyler, John H., to Westinghouse Air Brake Company. Linkage for ground positioning of an earth scraper elevator. 3,818,618, Cl. 37-8.000.

Hymatic Engineering Company, Limited, The: *See*—
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Hystron Fibers Incorporated: *See*—
Thrower, Herbert T., Jr., 3,819,402.

I-T-E Imperial Corporation: *See*—
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Tahiliani, Vasu H., 3,819,845.

ICI Australia Limited: *See*—
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Ideal Toy Corporation: *See*—
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Idemitsu Petrochemical Co., Ltd.: *See*—
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Igarashi, Sadao, to Alps Electric Co., Ltd. Double-tuned circuit device. 3,820,045, Cl. 333-70.00s.

Ihara, Takashi: *See*—
Komiya, Takao; Ihara, Takashi; Matsuo, Takehiko; Tosaka, Umi; Negishi, Hirokazu; and Ohhara, Karsunobu, 3,819,370.

Iijima, Hiroshi; Inamoto, Kinya; Fukuda, Shuzo; Shimoma, Takashi; and Miyachi, Tsuneharu, to Nippon Kokan Kabushiki Kaisha. Method and apparatus for controlling the quantity of oil coated on continuously moving material. 3,819,948, Cl. 250-559.000.

Iizuka, Tokutaro; and Mochizuki, Yoshinari, to Hope Kabushiki Kaisha. Ski boot toe fixture. 3,819,201, Cl. 280-11.35t.

Ilford Limited: *See*—
Brown, John Colin; and Keogh, Patrick Joseph, 3,819,698.

Squire, Elaine Josephine; and Ezekiel, Aaron David, 3,819,383.
Turner, George Frederick, 3,818,861.
Imagawa, Fumio: *See—*
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Imai, Kin-Ichi; and Honjo, Mikio, to Takeda Chemical Industries, Ltd. 2-Substituted adenosine derivatives and the production thereof. 3,819,612, Cl. 260-211.50r.
Imai, Kiyoshi; and Inomata, Hiroshi, to Shinetsu Chemical Company. Room temperature vulcanizing organosilicone compositions. 3,819,549, Cl. 260-18.00s.
Imme, Helmut; Blaimberger, Robert; and Schulz, Gunter, to Fa. J. N. Eberle & Cie. GmbH. Telescoping shield spring. 3,819,169, Cl. 267-155.000.
Imperial Chemical Industries Limited: *See—*
Anderson, Robert Craig, 3,818,915.
Feasey, Ronald George, 3,819,582.
Hayward, Christopher Frederick; and Smithers, Michael James, 3,819,606.
Moore, Colin; and Thornton, Michael Joseph, 3,819,491.
Pears, Gordon Edmund Alfred, 3,819,773.
Robinson, William; Davis, John Brian; and Skilling, Derek, 3,819,776.
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Bove, Fred, 3,819,523.
Inaga, Katsu. Tape cassette. 3,819,131, Cl. 242-199.000.
Inai, Yuichi; Okazaki, Kanzo; Uchiyama, Mikio; Shimada, Katsutoshi; Kagei, Kengo; and Bessho, Motoaki, to Eisai Co., Ltd. Quaternary salts of tri(β-propyloxyethyl) amine derivatives and process for producing same. 3,819,705, Cl. 260-567.60m.
Inamoto, Kinya: *See—*
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Industriaktiebolaget Broderna Larsson: *See—*
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Industrie Pirelli S.p.A.: *See—*
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Industries for the Blind, Incorporated: *See—*
Clark, John R., 3,819,034.
Ingham, Herbert Smith, Jr.; and Novinski, Edward Robert, to Metco, Inc. Flame spraying with powder blend of ferromolybdenum alloy and self-fluxing alloys. 3,819,384, Cl. 106-1.000.
Innovatex Corporation: *See—*
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Innovative Process Equipment, Inc.: *See—*
Shulz, Robert J.; and Kozinczuk, Orest A., 3,818,819.
Inokuchi, Seiji, to Tokyo Shibaura Electric Co., Ltd. Electromagnetic induction type pattern input apparatus. 3,819,857, Cl. 178-19.000.
Inokuma, Akira: *See—*
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Inomata, Hiroshi: *See—*
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Inomata, Nobuhiro; Ohba, Eiji; and Ogiwara, Tomowo, to Nippon Kokan Kabushiki Kaisha. Gas cutting machine. 3,819,162, Cl. 266-23.00m.
Inoue, Tadanori: *See—*
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Institutul de Cercetari Tehnologice Pentru Constructii de Masini: *See—*
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Integral Process Systems, Inc.: *See—*
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International Machine Products, Inc.: *See—*
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International Minerals & Chemical Corporation: *See—*
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International Nickel Company, Inc., The: *See—*
Bell, James Alexander E.; Opratko, Vaclav; and Clarkson, Daniel Kelly, 3,819,801.
International Paper Company: *See—*
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International Standard Electric Corporation: *See—*
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International Telephone and Telegraph Corporation: *See—*
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Irie, Masanori, to Nippon Selfoc Kabushiki Kaisha. Process for producing a light-conducting structure. 3,819,782, Cl. 264-49.000.
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Ironfield, Richard, to Amana Refrigeration, Inc. Waveguide filter for microwave heating apparatus. 3,819,900, Cl. 219-10.550.
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Iseda, Yutaka: *See—*
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Isenberg, Lionel: *See—*
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Ishibashi, Kazuhisa; and Terashima, Yoshimi, to Toyo Seikan Kaisha, Limited. Method and apparatus for detecting defects in a sealed portion of a package. 3,819,943, Cl. 250-341.000.
Ishibe, Kouichi: *See—*
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Ishida, Nakao; and Okuda, Tomoharu, to Tanabe Seiyaku Co., Ltd. Antibiotix largomycin and a method of producing same by cultivating streptomyces pluricolorescens NRRL 3679. 3,819,833, Cl. 424-117.000.
Ishigura, Ryoichi: *See—*
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Ishiguro, Yoshio: *See—*
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Ishihara, Shiya; and Suzuki, Yoshihiro, to Nippondenso Co., Ltd. Air pumps for an engine exhaust gas cleaning system. 3,819,308, Cl. 418-181.000.
Ishii, Akira: *See—*
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Ishii, Kiyoshi; Konomi, Syobu; and Ishiguro, Yoshio, to Daicel Ltd. Automatic cleaning arrangement for elongated tubular objects. 3,819,513, Cl. 210-23.000.
Ishii, Mitsuaki: *See—*
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Tokumitsu, Ichiro; Takemura, Toshisada; Sugiyama, Minoru; Nishiyama, Kenji; Ogawa, Shigeo; and Okiyama, Sadao, 3,818,975.
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Isii, Sigeki, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument keying system with envelope sample memorizing voltage dividers. 3,819,844, Cl. 84-1.260.
Isobe, Masahide, to Tokyo Sokuhan Kabushiki Kaisha. Loop height adjusting device for a supersonic wire bonder. 3,819,102, Cl. 228-1.000.
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Ito, Isao. Wiper device for vehicles. 3,818,535, Cl. 15-250.230.
Ito, Kenji: *See—*
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Ito, Ryoichi: *See—*
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Itoh, Katumi; Mori, Kazumasa; and Iwaki, Katsutaro, to Nippondenso Co., Ltd. Voltage regulating system for vehicle generators. 3,820,009, Cl. 322-28.000.

Itoh, Keiichi, to Olympus Optical Co., Ltd. Telephoto lens system. 3,819,253, Cl. 350-220.000.
Itoh, Mitsuto: *See—*
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Iwata, Hideki, to Tektronix, Inc. MOS-FET sample and hold system for digitizing high frequency signals. 3,820,033, Cl. 328-151.000.
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Jaccard, Roland; Hostettler, Paul; and Siegrist, Rudolf, to Ciga-Geigy AG. Apparatus for producing solids polymers by liquid transformation. 3,819,332, Cl. .
Jackoboice, Edward J.; Jackoboice, Edward W.; and Lruizenga, Gerritt H., to Monarch Road Machinery Company. Hydraulic control valve. 3,818,936, Cl. 137-596.120. .
Jackoboice, Edward W.: *See—*
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Sharpe, Anthony Nelson; and Jackson, Adrian Keith, 3,819,158.
Jacobs, Danford S., to M & T Chemicals Inc. Novel halophosphazine compounds. 3,819,809, Cl. 423-300.000.
Jacobs, James W., to General Motors Corporation. Means for altering the effective displacement of an axial vane compressor. 3,819,309, Cl. 418-219.000.
Jacobsen Manufacturing Company: *See—*
Haffner, Donald G.; Woelffer, Neill C.; and Wuerker, Charles A., 3,818,686.
Jacoby, Charles E.; and Lindqvist, Per Eric, to SI Handling Systems, Inc. Vehicle and track system. 3,818,837, Cl. 104-166.000.
Jacquelin, Roland, to Commissariat a l'Energie Atomique. Supporting and sealing device applicable to rotary seal plugs in nuclear reactor shield slabs. 3,819,479, Cl. 176-87.000.
Jaeger, Horst, to Ciba-Geigy AG. Perfluoroalkyl lalkylmonocarbocylic acid esters. 3,819,668, Cl. 260-408.000.
Jaeschke, Harold R., to Waldorf, Hoerner, Corporation. Frame carton. 3,819,035, Cl. 206-45.140.
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Jakobsen, William J., to Lourdes Industries, Inc. Electrical apparatus with bypass check valve to prevent flow into feeder line. 3,819,846, Cl. 174-11.00r.
Janci, John. Multiple contact ignition interrupter assembly. 3,819,884, Cl. 200-27.00a.
Janke, Donald Edward: *See—*
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Janle, Werner, to General Motors Corporation. Insulated exhaust pipe connection. 3,819,208, Cl. 285-47.000.
Janome Sewing Machine Co., Ltd.: *See—*
Nakada, Tetsuo; Ozaki, Yoshiaki; and Mishima, Fumiyuki, 3,818,828.
Jaronen, Niilo N.: *See—*
Sovijarvi, Arvi A. I.; and Jaronen, Niilo N., 3,819,937.
Jawelak, Melbourne G.; and Boni, Richard R., to McGraw-Edison Company. Auxiliary contact means for a circuit breaker. 3,819,893, Cl. 200-146.00r.
Jemison, William, to Heyman Manufacturing Company. Cable hanger. 3,819,139, Cl. 248-73.000.
Jensen, Norman P.: *See—*
Shen, Tsung-Ying; Fordice, Michael W.; Ruyle, William V.; and Jensen, Norman P., 3,819,603.
Jervis Corporation: *See—*
McIntyre, Matthew; and Hadley, Richard M., 3,818,780.
Jeunehomme, Michele L., to Bendix Corporation, The. Sensor for measuring the concentration of one gas in a multiple gas sample. 3,820,015, Cl. 324-33.000.
Jimenez, David J. Educational puzzle with paper writing surface. 3,818,615, Cl. 35-37.000.
Jiruse, Jaroslav, to Adamovske strojirny, Narodni podnik. Arrangement for generating control pulses for the adjustment of the level of a feed board, particularly for printing machines. 3,819,174, Cl. 271-154.000.
Jocaby, Jerold L.: *See—*
Bhuta, Pravin G.; Aprahamian, Robert; and Jocaby, Jerold L., 3,820,062.
Johanns, Johannes Hendricus Maria; Van Roosmalen, Johannes Hendricus; and De Boer, Thijs Johannes, to U.S. Philips Corporation. Display device with a channel plate and a cross bar electrodes addressing system. 3,819,969, Cl. 313-105.000.
Johansson, Bjorn-Olow, to Alfa-Laval AB. Piston and cylinder apparatus with cleaning arrangement. 3,818,805, Cl. 92-13.100.
Johansson, Sten Martin: *See—*
Klingstrom, Emil Allan; and Johansson, Sten Martin, 3,819,490.
Johne, Albrecht; Forster, Karl Heinz; and Schanze, Klaus, to Veb Pohygraph Lupzig ombinat fur Polygraphische Maschinen und Ausrustugen. Control arrangement for multiple color printing machines. 3,818,827, Cl. 101-184.000.
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Daniel, Leonard Irving; Sadler, Thomas H.; Nawn, John F.; and French, David Walter, 3,819,210.
Genson, Samuel Richard, 3,819,122.
Hedges, Lee Minor, 3,818,948.
Rogers, William M., Jr., 3,818,665.
Johnson, Alan C.: *See—*
Helmer, Rupert C.; and Johnson, Alan C., 3,818,544.
Johnson, Albin Kenneth, to Iomec Inc. Velocity determination with optoelectronic linear position transducer. 3,819,268, Cl. 356-28.000.
Johnson, Ivan Boris David: *See—*
Howard, Anthony Stonham; and Johnson, Ivan Boris David, 3,818,760.
Johnson, Lowell, to Transco Inc. and Removable insulated pipe jacket. 3,818,949, Cl. 138-158.000.
Johnson, Norman A.: *See—*
Davey, John R.; Gilbo, Charles F.; Johnson, Norman A.; and Fritz, Thomas W., 3,818,961.
Johnson, Robert P.: *See—*
Hall, Roger D.; and Johnson, Robert P., 3,820,117.
Johnson, Victor C., Jr. Deflection tester. 3,818,753, Cl. 73-94.000.
Johnson, Winston O.; and Davis, David W., 1/7 interest each to Willis, Ted; Holley, Willis H.; Lyles, Harold L. and 2/7 interest each to Sharp, Kennedy H.; Stuart, William L. Photodynamic monitor for and process of detecting the momentary presence of an obect between two points. 3,819,947, Cl. 250-559.000.
Johnston, James R.; and Moertel, George B., to Textron Inc. Method of forming end stops on slide fasteners. 3,818,575, Cl. 29-408.000.
Johnston, Laird E.: *See—*
Bowler, Lauren L.; and Johnston, Laird E., 3,819,235.
Johnston, Paul R., to Diamond Power Specialty Corporation. Power connecting apparatus for movable members. 3,819,880, Cl. 191-12.00r.
Joly, Jean, to La Telemecanique Electrique. Busway connector. 3,820,057, Cl. 339-22.00b.
Jones, Allen H., Jr.: *See—*
Glomski, Ronald L.; and Jones, Allen H., Jr., 3,819,593.
Jones, Cecil R., to Transfer Systems Incorporated. Apparatus for lowering and raising a shipping cask for spend nuclear fuel into a storage pool. 3,819,066, Cl. 214-16.00b.
Jones, Howard: *See—*
Shen, Tsung-Ying; and Jones, Howard, 3,819,716.
Jones, Irby C., Jr.; and Noack, Walter E., to Dow Chemical Company, The. Method for producing an alkali metal carbonate. 3,819,813, Cl. 423-421.000.
Jones, Joseph W., Jr.: *See—*
Clampitt, Bert H.; Harwell, Kenneth E.; and Jones, Joseph W., Jr., 3,819,514.
Jones, Kenneth R.: *See—*
Houst, Douglas R.; and Jones, Kenneth R., 3,818,687.
Jones, Leo V.; Keehn, Paul J.; and Zelinski, Paul A., to GTE Automatic Electric Laboratories, Incorporated. Computer processor register and bus arrangement. 3,820,084, Cl. 340-172.500.
Jones, Loyd W.; and Holman, George B., Jr., to Amoco Production Company. Mixed alcohols in well acidizing. 3,819,520, Cl. 252-8.55c.
Jones, Peter William, to Fisons Limited. Process for embossing a thermoplastic layer by selective expansion. 3,819,783, Cl. 264-52.000.
Jones, Robert L. Obstacle clearing attachment for caster wheels. 3,818,542, Cl. 16-18.0cg.
Jordal, Per: *See—*
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Jordan, Richard James, to General Marine Inc. Crowd control stick. 3,819,108, Cl. 231-2.00e.
Jordan, Thomas E., to Olin Corporation. Process for improving color and color stability of ethanolamines. 3,819,710, Cl. 260-584.00r.
Josephsen, Roy C.; and Weir, Clifford L., to Allied Chemical Corporation. Apparatus for molding articles. 3,819,313, Cl. 425-244.000.
Joshi, Narendra N. Antiviral agent FWH-775 and method of production. 3,819,832, Cl. 424-115.000.
Joslyn, Wallace G., to Dow Corning Corporation. Foaming unsaturated polyester resins. 3,819,672, Cl. 260-448.20n.
Juhnke, Paul B. Magnetic annunciator or signal device for control panels. 3,820,047, Cl. 335-229.000.
Juillou, Michel: *See—*

Brun, Jean-Pierre; Bulvestre, Gerard; Juillou, Michel; Thirion, Pierre; and Pautrat, Rene, 3,819,742.
Julian Engineering Company: *See*—
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Julian, Maurice F.; and Tork, James A. Helicopter hover simulator. 3,818,613, Cl. 35-12.00k.
Julien, Maurice Francois Alexandre, to Luxembourgeoise de Brevets et Participatiars. Railway car roll stablizing bogie. 3,818,841, Cl. 105-164.000.
Julin, Gustav: *See*—
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Junichi, Kabushiki Kaisha: *See*—
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K. C. Pen Co., Inc., mesne: *See*—
Pulaski, Albert, 3,819,283.
Kablaoui, Mahmoud S.; and Lachowicz, Donald R., to Texaco Inc. Preparation and stabilization of nitroalkylperoxy nitrates. 3,819,570, Cl. 260-453.00r.
Kabushiki Kaisha International Library: *See*—
Baba, Yoshiki; and Ayai, Yoshikazu, 3,818,610.
Kabushiki Kaisha Sega Enterprises: *See*—
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Kabushiki Kaisha Suwa Seikosha: *See*—
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Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Kuroyama, Toshinobu; Noba, Motoi; Fukuyama, Takahiko; and Teranishi, Nobuyuki, 3,819,928.
Kabushiki Kaisha Toyoda Jidoshikki Seisakusho: *See*—
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Kabushiki-Kaisha Tokai-Rika-Denki-Seisakusho: *See*—
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Kaestner, Erwin A.; and Spink, John, to Morton-Norwich Productd, Inc., mesne. Spray sanitizing system with electolytic generator. 3,819,329, Cl. 21-58.000.
Kagei, Kengo: *See*—
Inai, Yuichi; Okazaki, Kanzo; Uchiyama, Mikio; Shimada, Katsutoshi; Kagei, Kengo; and Bessho, Motoaki, 3,819,705.
Kageyama, Takao, to Nippon Electric Company, Limited. Velocity modulation tube having floating resonator circuits and short drift spaces. 3,819,977, Cl. 315-5.430.
Kaiser Aluminum & Chemical Corporation: *See*—
Lam, Hung-Kei H., 3,819,815.
Kaiser, Reinhold, to Licentia Patent-Verwaltungs-G.m.b.H. Methods of producing field effect transistors having insulated control electrodes. 3,818,582, Cl. 29-571.000.
Kajita, Hiroyuki: *See*—
Kuwayama, Hiroji; Kajita, Hiroyuki; Asayama, Tadashi; and Nishio, Nobuyuki, 3,819,327.
Kajiwara, Toshiyuki; Nishi, Hidetoshi; and Sonobe, Noriyoshi, to Hitachi, Ltd. Strip-take-up apparatus. 3,818,737, Cl. 72-134.000.
Kajiwara, Toshiyuki; Sonobe, Noriyoshi; Nishi, Hidetoshi; and Hayashi, Masahiro, to Hitachi, Ltd. Rolling mills. 3,818,743, Cl. 72-243.000.
Kajrup, Bengt Ake, to Saab-Scania Aktiebolag. Ball plug valve. 3,819,150, Cl. 251-315.000.
Kalmar, Arthur F., to FMC Corporation. Apparatus for coating fruit. 3,818,859, Cl. 118-24.000.
Kamiya, Takaaki: *See*—
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Kampfer, Helmut: *See*—
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Kanaya, Sadaaki: *See*—
Kunii, Takao; Tanaka, Teruaki; Kanaya, Sadaaki; and Nagayama, Shuichi, 3,819,975.
Kantrowitz, Arthur R.; and Rosa, Richard J., to Avco Corporation. Ram jet powered by a laser beam. 3,818,700, Cl. 60-203.000.
Kaplan, Richard B.; Gonnella, Sebastian; and Abrams, Walter M., to Ultramet. Composite anode for rotating-anode X-ray tubes thereof. 3,819,971, Cl. 313-330.000.
Kariyone, Kazuo: *See*—
Morimoto, Akira; Kariyone, Kazuo; Kurita, Masaru; Hashimoto, Masashi; and Nishiwaki, Osamu, 3,819,621.
Karker, Stig Rutger; and Bratland, Knut, to Aktiebolag Atomenergi. Pressure vessel. 3,818,935, Cl. 137-590.000.
Karlen, Urs: *See*—
Bosshard, Hans; Diamantoglou, Michael; Koelliker, Hans Peter; and Karlen, Urs, 3,819,665.
Karlsson, Goran Roland: *See*—
Carlsson, Eric Ake Ragnar; Dahlsjo, Olof Gustav Robert; Karlsson, Goran Roland; and Pettersson, Kent Morgan, 3,820,116.
Karper, Paul W.; and Porter, John P., to Goodrich, B. F., Company, The. Testing apparatus for elastomers. 3,818,751, Cl. 73-15.600.
Kasahara, Kakaaki: *See*—
Fushida, Yoshio; Suzuki, Kazuo; Kasahara, Kakaaki; Okawa, Kazuyoshi; and Ashizawa, Masayoshi, 3,819,025.
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Kasch, Robert: *See*—
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Kataoka, Yasuo; Shimizu, Morio; and Watanabe, Tomoo. Submerged combustion type vaporizer. 3,818,893, Cl. 126-360.00a.
Katch, Richard P.: *See*—
Hogue, Earl F.; and Katch, Richard P., 3,818,621.
Kato, Hiroshi, to Dainichi-Nippon Cables, Ltd. Method of preparing ferrocene polymers. 3,819,583, Cl. 260-63.00r.
Katoh, Kanji: *See*—
Matsushita, Mitsuhiro; Mirua, Akihiko; Uemura, Takeshi; and Katoh, Kanji, 3,818,671.
Katz, Michel, to Aurium Research Corporation. Dental alloy. 3,819,366, Cl. 75-172.00r.
Katzakian, Arthur, Jr.; and Steele, Roger B., to Aerojet-General Corporation. Catalysis of oxirane-imide systems. 3,819,746, Cl. 260-830.0tw.
Kaufman, Ernest D., to American Cyanamid Company. Vinylamide-acrolein polymers and paper of improved strength having a content thereof. 3,819,555, Cl. 260-29.4ua.
Kautz, Murrell F., to Honeywell Inc. Condition control apparatus. 3,820,049, Cl. 337-319.000.
Kawada, Sohji. Facial massager. 3,818,904, Cl. 128-56.000.
Kawagoe, Takahiro: *See*—
Onishi, Akira; Irako, Koichi; Iseda, Yutaka; Hayakawa, Yoshihiro; Kawagoe, Takahiro; and Miyamoto, Shoji, 3,819,590.
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Kawahara, Ichizo, to Olympus Co., Ltd. Device for measuring dimensions from the forward end portion of an endoscope. 3,819,267, Cl. 356-21.000.
Kawahito, Norihiko: *See*—
Ono, Katsuya; Fujiwara, Motozo; Tabe, Norihiko; and Kawahito, Norihiko, 3,819,792.
Kawamoto, Isao: *See*—
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Kazmeier, Gunther; and Hadam, Wilhelm, to Stoll, H., and Company. Needle selecting mechanism for flat knitting machines. 3,818,726, Cl. 66-75.000.
Kee, Richard C.: *See*—
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Keehn, Paul J.: *See*—
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Keeney, Kenneth W.: *See*—
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Keeney, William W.; and Bolling, Henry E. Bowstring release. 3,818,888, Cl. 124-35.00a.
Kehr, J. Alan, to Minnesota Mining and Manufacturing Company. Vinyl halide polymer/epoxide resin powder coating compositions. 3,819,560, Cl. 260-31.800.
Keiner, Heinz: *See*—
Feindler, Ernst; and Keiner, Heinz, 3,820,147.
Keiner, Heinz, to Leitz, Ernst, GmbH, Firma. Shutter cocking and film transport mechanism for a roll film camera. 3,820,143, Cl. 354-206.000.
Keith, Billy M.; Bussey, James R.; Cannon, Sidney E.; Patton, James C.; Fisher, Perry G.; Caldwell, Joseph H.; and Crocker, Ralph H., Jr., to Taggart, Campbell, Inc. Continuous dough making process. 3,819,837, Cl. 426-27.000.
Keith, Charles H.: *See*—
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Kelley, Donald W.: *See*—
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Kelly, Charles R.: *See*—
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Kelsey-Hayes Company: *See*—
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Kemp, Rodney J., to Eastman Kodak Company. Compositions for treating silver images. 3,819,374, Cl. 96-29.00l.
Kemp, Woodrow E., to Koppers Company, Inc. 1-(Bis(2-hydroxypropyl)-nitriloethylene)-5-arsa-1-aza-4,6-dioxacycloactyl arsenic ether. 3,819,670, Cl. 260-440.000.
Ken Hayashibara: *See*—
Okada, Shigetaka; Tsuyama, Naoto; Mitsuhashi, Masakazu; and Ogasawara, Junsuke, 3,819,484.
Kendall, Giles A.; and Wallace, William D., 1/2 each to Menasco Manufacturing Co., and Miner Enterprises, Inc. Damping apparatus. 3,819,060, Cl. 213-43.000.

Kendall, Harold E., Jr. Apparatus for peeling fruit and vegetables. 3,818,821, Cl. 99-540.000.

Kendrick, Gary R.: *See—*
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Kennecott Copper Corporation: *See—*
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Kennedy, Alexander W.: *See—*
De Ridder, Jon A.; and Kennedy, Alexander W., 3,819,425.

Kennedy, C. Bruce, to Polaroid Corporation. Automatic photostudio comprising automatic film cassette changing apparatus. 3,820,136, Cl. 354-81.000.

Kennell, Franklin B. Burglar and personal protection alarm for vehicles. 3,820,066, Cl. 340-65.000.

Kenreich, Richard R.; Schulz, Paul L.; Houck, Albert; and Kretchman, Gerald L., to Whirlpool Corporation. Brake yoki rod retainer for automatic washers. 3,818,729, Cl. 68-23.700.

Keogh, Patrick Joseph: *See—*
Brown, John Colin; and Keogh, Patrick Joseph, 3,819,698.

Kerb, Ulrich; Kolb, Karl Heinz; and Klink, Gunter, to Schering Aktiengesellschaft. 6,9,21-Trihalogenosteroids. 3,819,604, Cl. 260-239.55r.

Kerl, Fritz: *See—*
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Kernforschungsanlage Julich GmbH: *See—*
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Kessler, Hans-Joachim: *See—*
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Keulen, Werner: *See—*
Schultes, Tilman; Keulen, Werner; and Rottner, Gunter, 3,818,919.

Khurana, Ranbirsingh G.; and Dawson, Charles R., to United States of America, Health, Education and Welfare. Preparation of urushiol from poison ivy or poison oak. 3,819,726, Cl. 260-625.000.

Kibler, Lynden Underwood, to Bell Telephone Laboratories, Incorporated. Temperature sensitive fiber-optic devices. 3,819,250, Cl. 350-96.00r.

Kicher, Harald. Fastener for neckties. 3,818,546, Cl. 24-49.00a.

Kidron, Zeev. Method for making prestressed precast concrete elements. 3,819,794, Cl. 264-228.000.

Kiess, Raymond W.; and Stewart, Peter H., to First National Bank of Miami, mesne. Digital direct reading colorimeter. 3,819,276, Cl. 256-184.000.

Kilby, Jack S.; Merryman, Jerry D.; and Van Tassel, James H., to Texas Instruments, Incorporated. Miniature electronic calculator. 3,819,921, Cl. 235-156.000.

Kime, James A., to Hydron, Inc. Fluid actuating mechanism having alternatively selectable fast and slow modes of operation. 3,818,801, Cl. 91-411.00b.

Kimitsuka, Akira: *See—*
Oka, Takashi; Arima, Tatsuhiro; and Kimitsuka, Akira, 3,819,204.

Kinase, Kadeo; Higuchi, Akiyoshi; and Inokuma, Akira, to Mitsubishi Denki Kabushiki Kaisha. Inflatable escape slideway apparatus. 3,819,011, Cl. 182-48.000.

Kinder, Allan R. Ball valve. 3,819,149, Cl. 251-309.000.

Kinderman, Abraham S.; and Kinderman, John, to Brite Star Manufacturing Company, Inc. Foldable decorative structure with reenforcing members. 3,819,458, Cl. 161-15.000.

Kinderman, John: *See—*
Kinderman, Abraham S.; and Kinderman, John, 3,819,458.

King, Jack B., to General Motors Corporation. Purge control valve and system. 3,818,942, Cl. 137-625.500.

King, Michael Charles: *See—*
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King, Terry R.: *See—*
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Kinkaid, Robert John; and Asick, John Carl, to AMP Incorporated. Releasing tool for multiple contact. 3,818,569, Cl. 29-203.00h.

Kinoshita, Kunio; and Itoh, Mitsuto, to Olympus Optical Co., Ltd. Endoscope assembly having its optical system provided with a direction shifter. 3,818,902, Cl. 128-6.000.

Kinoshita, Shouzo, to Pioneer Electronic Corporation. Loudspeaker with improved voice coil support. 3,819,876, Cl. 179-115.5vc.

Kinslow, William Edward, Jr.: *See—*
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Kirakawa, Hoichi: *See—*
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Kirch, William: *See—*
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Kircher, Dieter: *See—*
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Kirchmayr, Rudolf, to Ciba-Geigy Corporation. v-Triazolylcoumarins. 3,819,645, Cl. 260-308.00b.

Kish, Charles A. Flexible valve. 3,819,151, Cl. 251-342.000.

Kishino, Shigeo: *See—*
Aya, Masahiro; Kishino, Shigeo; Kudamatsu, Akio; Fukazawa, Nobuo; Kume, Toyohiko; and Shiokawa, Kozo, 3,819,754.

Kitamoto, Tatsuji; and Yamada, Yasuyuki, to Fuji Photo Film Co., Ltd. Ferromagnetic chromium dioxide composition and magnetic recording medium containing same. 3,819,411, Cl. 117-235.000.

Klass, Donald L.; and Landahl, Carl D., to Institute of Gas Technology. Separation of gaseous mixtures under non-steady state conditions. 3,818,679, Cl. 55-16.000.

Klauke, Erich: *See—*
Kuhle, Engelber; Klauke, Erich; Hammann, Ingeborg; Hamburger, Brigitte; and Frohberger, Paul-Ernst, 3,819,684.

Klein, Ira: *See—*
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Kleiner, Eduard K.; and Falk, Robert A., to Ciba-Geigy Corporation. Perfluoroalkyl carboxylic acids. 3,819,666, Cl. 260-402.500.

Kleinhaut, Samuel; and Thiel, Herbert Willy, to Bagprint Ltd. Handle inserting device. 3,818,811, Cl. 93-8.0wa.

Kleinpeter, Jack D.: *See—*
Hopper, Paul J.; Kleinpeter, Jack D.; and Milano, Dominic C., 3,818,516.

Klema, Kenneth G., to Beffel, Raymond W. Armature testing device and method. 3,819,046, Cl. 209-74.00m.

Kliegman, Jonathan M., to Union Carbide Corporation. Substituted tetramethoxy derivatives. 3,819,720, Cl. 260-615.00a.

Klievoneit, Harold R. Method for fabricating a discfile. 3,818,649, Cl. 51-323.000.

Kline, Joseph. Apparatus and method for harvesting forage. 3,818,955, Cl. 141-12.000.

Klingstrom, Emil Allan; and Johansson, Sten Martin. Testing device for use when making bacteriological test. 3,819,490, Cl. 195-127.000.

Klink, Gunter: *See—*
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Klink, Jerome P.: *See—*
Thumm, J. Randall; Roberson, Cletis L.; and Klink, Jerome P., 3,819,344.

Klochemann, Karl Heinz; and Wurzbacker, Frank, to British Petroleum Company Limited, The. Liquid product control system. 3,819,305, Cl. 417-413.000.

Kloda, Herbert; and Hies, Rudolf, to Maschinenfabrik R. Wolf Aktiengesellschaft. Apparatus for removing liquid from aqueous pulp. 3,818,824, Cl. 100-116.000.

Klose, Peter M.; and Ovshinsky, Stanford R., to Energy Conversion Devices, Inc. Method of imaging and imaging material. 3,819,377, Cl. 96-48.00r.

Knapsack Aktiengesellschaft: *See—*
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Knell, Martin: *See—*
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Kniepkamp, Hermann, to Siemens Aktiengesellschaft. Method of producing schottky contacts. 3,819,432, Cl. 156-11.000.

Knifton, John F., to Texaco Inc. Process for preparing linear fatty acids by carboxylation of olefins. 3,819,669, Cl. 260-410.90r.

Knox, Harold L., to Detroit Stoker Company. Conveyor system. 3,819,211, Cl. 285-336.000.

Kobayashi, Fujio: *See—*
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Kobayashi, Shigehiko: *See—*
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Kobayashi, Takayuki: *See—*
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Suenaga, Masanobu; Machii, Tetsuo; Sawano, Takahiro; Kobayashi, Takehiko; Dengo, Tadao; and Nakai, Tetsuzp, 3,818,584.

Kobelt, Jack R. Time-delay cam. 3,818,771, Cl. 74-99.000.

Kobzina, John W., to Chevron Research Company. Substituted triazines. 3,819,626, Cl. 260-249.800.

Koch, Walter T.: *See—*
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Koebner, Adolph: *See—*
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Koelliker, Hans Peter: *See—*
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Koenig, Fredrick: *See—*
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Koenig, Karl-Heinz: *See—*
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Koeppen, William E.: *See—*
Paulick, David R.; Wark, Emerson L.; and Koeppen, William E., 3,819,244.

Koerner, Frances; and Szuch, Joseph. Ball retrieving apparatus. 3,819,049, Cl. 209-250.000.

Koff, Fred W.; and Pisanchyn, John, to Allied Chemical Corporation. Purification of lysine amide of carboxylate salts thereof. 3,819,699, Cl. 260-561.00a.

Kohara, Haruki, to Nippon Electric Co., Ltd. Magnetic domain splitter. 3,820,091, Cl. 340-174.0tf.

Kohn, Mitchell I.; and Alton, Ahdor Hermyrt, to Love Controls Corporation. Controller circuit. 3,819,960, Cl. 307-310.000.

Koiwa, Yoichi: *See—*
Fujimoto, Yasuo; and Koiwa, Yoichi, 3,819,588.

Kolb, Edwin R., to Harris-Intertype Corporation. Composing apparatus. 3,819,854, Cl. 178-6.70r.

Kolb, Karl Heinz: *See*—
Kerb, Ulrich; Kolb, Karl Heinz; and Klink, Gunter, 3,819,604.

Kollmorgen Corporation: *See*—
Noodleman, Samuel, 3,819,964.

Kolobow, Theodor, to United States of America, Health, Education and Welfare. Method of making thin defect-free silecone rubber films and membranes. 3,819,772, Cl. 264-22.000.

Kominek, Georg, to Aktiengesellschaft Jungbunzlauer Spiritus- und Chemische Fabrik. Process for the production of trialkali citrates. 3,819,696, Cl. 260-535.00p.

Komiya, Takao; Ihara, Takashi; Matsuo, Takehiko; Tosaka, Umi; Negishi, Hirokazu; and Ohhara, Karsunobu, to Canon Kabushiki Kaisha. Photoconductive element and process of preparing same using thermo-shrinkable material. 3,819,370, Cl. 96-1.500.

Kondo, Kaneichi; Ishii, Akira; and Takeuchi, Hiromoto, to Matsushita Electric Industrial Co. Ltd. High voltage generating piezoelectric igniter. 3,819,963, Cl. 310-8.700.

Kondo, Yoshikazu: *See*—
Nakamura, Kihei; Yamazaki, Harumichi; and Kondo, Yoshikazu, 3,819,167.

Konen, Dolores A.: *See*—
Silbert, Leonard S.; and Konen, Dolores A., 3,819,688.

Konishi, Nobukiyo: *See*—
Takano, Tadayoshi; Kurita, Masaru; Nikaido, Hiroo; Mera, Masashi; Konishi, Nobukiyo; and Okui, Ritsuko, 3,819,623.

Konomi, Syobu: *See*—
Ishii, Kiyoshi; Konomi, Syobu; and Ishiguro, Yoshio, 3,819,513.

Konrad, Charles E.; and Chausse, Burnette P., to General Electric Company. Cycloconverter interface apparatus. 3,820,109, Cl. 340-347.0nt.

Konrad, Kurt, to Leam, John A. Material treating furnace. 3,818,847, Cl. 110-8.00r.

Koplewicz, Joseph; and Brenner, Stanley S. Parking aid device. 3,820,065, Cl. 340-51.000.

Koppers Company, Inc.: *See*—
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Kemp, Woodrow E., 3,819,670.
Sefton, Robert C., 3,819,391.

Kornrumpf, William P.; and Harnden, John D., Jr., to General Electric Company. Opto-electronic transducers for object detection. 3,819,938, Cl. 250-222.00r.

Korntheuer, Friedrich, to Gebr. Bohler & Co., AG. Reference voltage generator for thermal processes having an exponential temperature-time characteristic. 3,819,950, Cl. 307-149.000.

Kornylak, Andrew T., to Kornylak Corporation. Textured surface, cellular core sheet material. 3,819,781, Cl. 264-46.000.

Kornylak Corporation: *See*—
Kornylak, Andrew T., 3,819,781.

Kosky, Philip G., to General Electric Company. Single valve vapor push pump. 3,819,301, Cl. 417-209.000.

Kothari, Vipin M.; and Tazuma, James J., to Goodyear Tire & Rubber Company, The. Hydrogenation process. 3,819,734, Cl. 260-666.00a.

Kotov, Illijus; Falk, Morris; and Falk, Sidney, to Fort Lock Corporation. Tubular key cutting machine. 3,818,798, Cl. 90-13.050.

Kountz, Jack M.: *See*—
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Kovac, William. Laminated adhesive tape. 3,819,467, Cl. 161-113.000.

Kowa Company, Ltd.: *See*—
Nagai, Hidetaka; Sato, Eiichi; and Kobayashi, Fujio, 3,819,822.

Kowal, Leonard: *See*—
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Koyama, Seiji: *See*—
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Kozinczuk, Orest A.: *See*—
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Kozlowski, Joseph J.: *See*—
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Kozorezov, Konstanti Isaakovich; Semchenko, Vitaly Vasilievich; Biteryakov, Viktor Vasilievich; Mikhailu, Georgy Ivanovich; and Skugorova, Ninel Fedorovna. Explosion circuit breaker. 3,819,890, Cl. 200-61.080.

Kraft, Paul; and Altscher, Siegfried, to Stauffer Chemical Company. Fire retardant thermoplastic polymer compositions. 3,819,770, Cl. 260-898.000.

Kraft, Sven Erik, to Industriaktiebolaget Broderna Larsson. Washing apparatus. 3,818,538, Cl. 15-322.000.

Kramer, Howard J.; and Klein, Ira. Datable food storage container. 3,818,858, Cl. 116-133.000.

Kramer, John W., to Westinghouse Air Brake Company. Fail-safe solid state highway crossing protection apparatus. 3,819,934, Cl. 246-130.000.

Krapfenbauer, Hans: *See*—
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Kratos: *See*—
Hale, Elgie J., 3,819,918.

Kraus, Max H.; Baccellieri, Michael P.; and McClintock, Bruce, to Electro-Nite Co. Phase change detector cup. 3,818,762, Cl. 73-359.000.

Krauzer, Erwin. Writing instrument. 3,819,284, Cl. 401-151.000.

Krebs, Hans Dieter; and Leeding, Mervyn Vero, to ICI Australia Limited. N-acyl carbamate production. 3,819,683, Cl. 260-479.00c.

Kreider, Robert W., to De Soto, Inc. Method of making high opacity resin porous films and aqueous latex for producing said films. 3,819,542, Cl. 260-2.50m.

Krekeler, Jerome H.: *See*—
Aboutboul, Henri A.; Krekeler, Jerome H.; and Kirch, William, 3,819,811.

Kresa, Zdenek: *See*—
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Kretchman, Gerald L.: *See*—
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Kreuder, Hans-Joachim: *See*—
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Krewson, Neil N.; and Tait, John B., to International Business Machines Corporation. Electro-optical read system. 3,820,069, Cl. 340-146.30h.

Kronick, Melvyn N.; MacLowry, James; and Bruce, Daniel, to United States of America, Health, Education, and Walfare. . 3,819,489, Cl. Bacteria detector.

Krumke, Warren E.: *See*—
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Kubicek, Donald H.: *See*—
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Kubitz, Karl Alfred; and Wicke, Alfred Frederick, to Reichhold Chemicals, Inc. Extractive distillation of citrus limonene. 3,819,737, Cl. 260-675.500.

Kubo, Takeshi: *See*—
Takagi, Nobuo; Kubo, Takeshi; and Takiguchi, Takashi, 3,819,339.

Kubovich, Frank Steve: *See*—
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Kuckro, Gerard W.; and Lorand, George E., to National Distillers and Chemical Corporation. High voltage insulated conductor. 3,819,410, Cl. 117-232.000.

Kudamatsu, Akio: *See*—
Aya, Masahiro; Kishino, Shigeo; Kudamatsu, Akio; Fukazawa, Nobuo; Kume, Toyohiko; and Shiokawa, Kozo, 3,819,754.

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Kuhle, Engelber; Klauke, Erich; Hammann, Ingeborg; Hamburger, Brigitte; and Frohberger, Paul-Ernst, to Bayer Aktiengesellschaft. Sulfenylated N-methylcarbamic acid arylesters. 3,819,684, Cl. 260-479.00c.

Kuhle, Engelbert: *See*—
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Kulite Semiconductor Products, Inc.: *See*—
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Kumakawa, Masaru: *See*—
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Kume, Toyohiko: *See*—
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Kummer, Joseph T.: *See*—
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Kunii, Takao; Tanaka, Teruaki; Kanaya, Sadaaki; and Nagayama, Shuichi, to Matsushita Electronics Corporation. Multi-digit glow indicator tube. 3,819,975, Cl. 313-517.000.

Kunz, Bernard P. Apparatus for winding filamentary material around the periphery of an upright structure. 3,819,450, Cl. 156-425.000.

Kuppersbusch, F., & Sohne Aktiengesellschaft: *See*—
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Kurasiewicz, Adam S.: *See*—
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Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
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Kurisu, Shizuka: *See*—
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Kurita, Kentaro: *See*—
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Takano, Tadayoshi; Kurita, Masaru; Nikaido, Hiroo; Mera, Masashi; Konishi, Nobukiyo; and Okui, Ritsuko, 3,819,623.

Kurkov, Victor P.; and Sharman, Samuel H., to Chevron Research Company. Linear alkyl geminal disulfonates as phosphate-free actives. 3,819,691, Cl. 260-513.00r.

Kurooka, Shigeru: *See*—

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Kurosawa Tele-Communications Limited: *See—*
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Kuroyama, Toshinobu; Noba, Motoi; Fukuyama, Takahiko; and Teranishi, Nobuyuki, to Kabushiki Kaisha Tokai Rika Denki Seisakusho and Toyota Jidosha Kogyo Kabushiki Kaisha. Switch knob lighting device. 3,819,928, Cl. 240-25.000.
Kuroyanagi, Makoto: *See—*
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Kurtz, Anthony D.; Gravel, Charles L.; and Hallon, Joseph R., Jr., to Kulite Semiconductor Products, Inc. Method of making transducers employing integral protective coatings and supports. 3,819,431, Cl. 156-7.000.
Kurz, Bruno: *See—*
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Kutsykovich, Dorina Borisovna: *See—*
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Kuwayama, Hiroji; Kajita, Hiroyuki; Asayama, Tadashi; and Nishio, Nobuyuki, to Meisei Chemical Works, Ltd. Method of printing synthetic fibers. 3,819,327, Cl. 8-172.000.
Kwantes, Arien; and Stouthamer, Bernhard, to Shell Oil Company. Purification of crude primary alcohols. 3,819,728, Cl. 260-643.00b.
Kwolek, Stephanie Louis, to Du Pont de Nemours, E. I., and Company. Wholly aromatic carbocyclic polycarbonomide fiber having orientation angle of less than about 45°. 3,819,587, Cl. 260-78.00r.
Kyowa Hakko Kogyo Kabushiki Kaisha: *See—*
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Kyriakou, George S. Quick split arbor. 3,819,193, Cl. 279-2.00r.
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Kyuma, Tatsuo: *See—*
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La Cellophane: *See—*
Grumbach, Pierre, 3,819,788.
La Ganke, Robert D. Air flow control valve. 3,818,937, Cl. 137-604.000.
La Telemecanique Electrique: *See—*
Joly, Jean, 3,820,057.
Lab-Volt (Quebec) Limited: *See—*
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Laboratoires Andre Guerbet: *See—*
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Lacey, Ralph W., to Kysor Industrial Corporation. Cutter body and blade therefor. 3,818,562, Cl. 29-105.00a.
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Lacklison, David Edward; Annis, Alexander David; and Pearson, Ronald Ferguson, to U.S. Philips Corporation. Photosensitive magnetic device. 3,819,944, Cl. 250-353.000.
LaCosta, Nicholas J.: *See—*
Demyon, Thomas R.; and LaCosta, Nicholas J., 3,820,098.
Lafon, Victor, to Societe Anonyme dite: Orsymonde. Butyramidine. 3,819,702, Cl. 260-564.00g.
Lahr, Roy J.; and Gruenke, Roger A., to Xerox Corporation. Method and apparatus for generating an R-interval histogram. 3,820,025, Cl. 324-182.000.
Laitram Corporation, The: *See—*
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Lapeyre, James M., 3,818,704.
Lam, Hung-Kei H., to Kaiser Aluminum & Chemical Corporation. Sulfate removal from magnesium chloride. 3,819,815, Cl. 423-498.000.
Lama, Ugis Guntis, to Bell Canada-Northern Electric Company, Limited. Magnetic bubble domain detection. 3,820,089, Cl. 340-174.0eb.
Lamartina, Alfonso; Cicognani, Enrico; Caldarella, Riccardo; and Antonini, Athos, to Societa Italiana Telecomunicazioni Siemens S.p.A. Line concentrator for telephone exchange. 3,819,869, Cl. 179-18.0fc.
Lambrou, Andreas: *See—*
Smith, Ross Alexander; and Lambrou, Andreas, 3,819,838.
Lammers, Peter C.; and Stefan, Frank N., to Goodyear Tire & Rubber Company, The. Protective headgear. 3,818,508, Cl. 2-3.00r.
Lamont, Romanus Michael. Lamp guard. 3,819,930, Cl. 240-54.00r.
Lamparsky, Dietmar; and Schudel, Peter, to Givaudan Corporation. Mercapto-or alkylthio-substituted terpenoids. 3,819,712, Cl. 260-593.00r.
Land, Edwin H., to Polaroid Corporation. Sensitometric modification by pre-exposure. 3,819,376, Cl. 96-45.200.
Landahl, Carl D.: *See—*
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Landgraf, Walter D. Multiple utility ribbon spool. 3,819,027, Cl. 197-175.000.
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Lang, Donald D., to Spectra-Strip Corporation. Apparatus for compression and coldwelding of stripped ends of multi-conductor cable. 3,819,104, Cl. 228-3.000.
Langsdorf, William P., Jr., to Du Pont de Nemours, E. I., and Company. Plant growth regulant carbamoylphosphonates. 3,819,353, Cl. 71-76.000.
Lanier Electronic Laboratory, Inc.: *See—*
Bolick, Fred C., Jr., 3,820,101.
Lapeyre, James M., to Laitram Corporation, The. Wave energy converter array. 3,818,703, Cl. 60-504.000.
Lapeyre, James M., to Laitram Corporation, The. Apparatus for converting the energy of ocean waves. 3,818,704, Cl. 60-504.000.
Lapiere, Charles-Leon Albert: *See—*
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Large, Bryan John: *See—*
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Larsh, Everett P. Slip stabilizer fin. 3,818,959, Cl. 114-126.000.
Larson, Martin E., to Honeywell Inc. Flame detection system with compensation for the flame detector. 3,820,097, Cl. 340-228.200.
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Paton, Boris Evgenievich; Theddvar, Boris Izrailevich; Latash, Jury Vadimovich; Chekotilo, Leonty Vasilievich; Emelyanenko, July Georgievich; Us, Vasily Ivandvich; Baglai, Vitaly Mikhailovich; Martyn, Viktor Mikhailovich; Artamonov, Viktor Leonidovich; Bonarenko, Oleg Petrovich; Boiko, Georgy Alexandrovich; Tsikulenko, Anatoly Konstantinovich; Ivon, Vasily Vladimirovich; and Pavlov, Leonid Viktorovich, 3,818,973.
Laurent, Daniel, to Societe Dauphinoise Electrique. Articulated parallelogram support mechanism for connecting a current collecting head to a high speed vehicle. 3,819,881, Cl. 191-66.000.
Lavs, Arthur Ernest, to Hawker Siddeley Dynamics Limited. Optical instruments. 3,819,940, Cl. 250-227.000.
Layton, Beryl W.; and Weaver, William J., to Square D Company. Auxiliary switch for molded-case circuit breaker. 3,820,046, Cl. 335-13.000.
Leam, John A.: *See—*
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Lebensfeld, Steven. Bubble film holding wand. 3,818,627, Cl. 46-7.000.
Lebold, Steven. Orthopedic device. 3,818,905, Cl. 128-77.000.
Lechtenberg, Leo J.: *See—*
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Leder & Co. AG: *See—*
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Ledergerber, Anton, to Inventa AG fur Forschung und Patentverwertung. Process and apparatus for grinding granular materials at low temperatures. 3,818,976, Cl. 165-1.000.
Lee, Charles A.; and Hunt, Robert F., to International Paper Company. Papermaking machine drainage device and rotatable support structure therefor. 3,819,475, Cl. 162-354.000.
Lee, Gerry A.: *See—*
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Lee, Gim F., Jr., to General Electric Company. High impact strength thermoplastic compositions. 3,819,761, Cl. 260-874.000.
Lee, Norman, to British Aircraft Corporation Limited. Aircraft flap system. 3,819,133, Cl. 244-42.0da.
Lee, Raymond, Organization, Inc., The: *See—*
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Lee, Sang H., to Pullman Incorporated. Container car. 3,818,843, Cl. 105-366.00r.
Lee-Norse Company, mesne: *See—*
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Legg, Billy J.: *See—*

Funk, Paul M.; Legg, Billy J.; and Baldwin, Richard W., 3,819,585.
Leggett, Guy O. Paint roller cleaner. 3,818,529, Cl. 15-1.000.
Lehde, John W., Jr.; and Vora, Prabodh M., to Bendix Corporation, The. Collet construction. 3,819,195, Cl. 279-46.000.
Lehnert,Gunter: *See—*
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Leifheit, Gunter; and Liebscher, Johannes, to Leifheit International Guenter Leifheit KG. Sweeper. 3,818,532, Cl. 15-42.000.
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Leisure Group, Inc., The: *See—*
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Leon, Luis P.: *See—*
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Leonov, Oleg Borisovich; Arapov, Viktor Viktorovich; Pavljukov, Vladimir Grigorievich; Oblasti, Zhukovsky Moskovskoi; Patrakhaltsev, Nikolai Nikolaevich; Manuilov, Nikolai Nikolaevich; and Soldatov, Nikolai Konstantinovich. Fuel system of internal combustin engine. 3,818,882, Cl. 123-139.0as.
Leopold, Wilbur R., Jr., to Mueller Co. Meter riser assembly. 3,819,207, Cl. 285-45.000.
Lersch, Alfred E. Table tennis table having two barriers defining areas mounted thereon. 3,819,182, Cl. 273-95.00r.
Leshem, Adam, to Combustion Engineering, Inc. Remote cutting apparatus. 3,818,786, Cl. 82-70.200.
Levens, Freer T. Portable tank and shell. 3,819,079, Cl. 220-5.00a.
Lever Brothers Company: *See—*
Sharpe, Anthony Nelson; and Jackson, Adrian Keith, 3,819,158.
Levine, Irving E.; Huckins, Harold A.; and Herzog, Stanley. Catalyst recycle. 3,819,663, Cl. 260-348.50l.
Levine, Seymour D., to Squibb, E. R., & Sons, Inc. Isoindolo(7,1,2-hij)quinolines. 3,819,624, Cl. 260-247.20a.
Levine, Seymour D.; and Principe, Pacifico A., to Squibb, E. R., & Sons, Inc. 9-Hydroxy fluorene-2-alkanoic acids and esters thereof. 3,819,693, Cl. 260-520.000.
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Lewis, Eugene C.; Gottlieb, C. Robert; and Macy, Robert H., to Diamondhead Corporation. Method and apparatus for transporting factory constructed housing units. 3,818,852, Cl. 114-72.000.
Lewis, Jay L.: *See—*
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Lillo, Arnold. Food heating device for snowmobiles. 3,818,889, Cl. 126-19.500.
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Linde Aktiengesellschaft: *See—*
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Lindeberg, Nils G. Method and apparatus for testing tightness. 3,818,752, Cl. 73-49.200.
Lindner, Fritz, to Pen Pentac-Ondresden Kamera-und Kinowerke. Exposure setting device in photographic apparatus. 3,820,132, Cl. 354-53.000.
Lindner, Hannes, to Oesterreichisch-Alpine Montangesellschaft. Railway switch for vignoles rails. 3,819,935, Cl. 246-435.000.
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Okumura, Osamu; Sakatani, Takenobu; and Nagayama, Masuzo, 3,819,718.
Lipschutz, Paul, to Societe d'Exploitation des Bevets Nieman. Electric multi-position switch. 3,819,887, Cl. 200-44.000.
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Liset, Magna Oddnar, 1/2 to Liset, Jean Elizabeth. Additive measuring device. 3,818,925, Cl. 137-99.500.
List, Herbert A., to List Industries, Inc. Storage locker. 3,819,246, Cl. 312-257.0sk.
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Liu, Chang P. Energy absorbing safety bumper. 3,819,218, Cl. 293-70.000.
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Long, Hubert G.; and Long, Veron E. Sewage treatment system. 3,819,054, Cl. 210-195.000.
Long, Richard H. Gem faceting machine. 3,818,641, Cl. 51-125.500.
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Loose, Jack D., to United States of America, National Aeronautics and Space Administration. Steady state thermal radiometers. 3,819,419, Cl. 136-213.000.
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Lorenz, Walter; Boshagen, Horst; Hammann, Ingeborg; and Behrenz, Wolfgang, to Bayer Aktiengesellschaft. Benzisoxazolo (thiono) phosphoric (phosphonic) acid esters. 3,819,644, Cl. 260-307.00d.
Lorina, John; Aluisy, G. Ronald; Loud, Norman D.; and Rines, Robert H. Irradiated substance and compound and method of preparing the same. 3,819,820, Cl. 424-1.000.
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Lorina, John; Aluisy, G. Ronald; Loud, Norman D.; and Rines, Robert H., 3,819,820.
Loulicovitch, Maurice; and Georgiou, Jean, to Societe Genevoise d'Industruments de Physique. Method of reading and interpolation for a precision rule and apparatus for carrying it out. 3,819,274, Cl. 356-170.000.
Lourdes Industries, Inc.: *See—*
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Frederiksen, Erling Kund; and Godtfredsen, Wagn Ole, 3,819,643.
Lower, William. Simpson, Orville, Company, The Feed distributor for screening machine. 3,819,050, Cl. 209-254.000.
Lowther, Robert C. Simulated golf game [6 273/134.0cg. 3,819,185, Cl. .
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Luce, Nunzio A., to Optel Corporation. Decoder and driver circuits particularly adapted for use with liquid crystal displays. 3,820,108, Cl. 340-336.000.
Ludt, William C., to Ethyl Corporation. Conductivity measurement system. 3,820,014, Cl. 324-30.00r.
Ludwig-Ofag-Indugas Industrieanlagen GmbH: *See—*
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Luebbe, Ray H., Jr.; and Byrne, John F., to Xerox Corporation. Manifold imaging member employing a fixative layer. 3,819,368, Cl. 96-1.500.
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Luxembourgeoise de Brevets et Participatiars: *See—*
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Maiocchi, Luigi, to Industrie Pirelli S.p.A. Tread profile of a radial tire for motor vehicles. 3,818,964, Cl. 152-209.00r.
Majkrzak, Charles P.; and Sladowski, Stephen F. X., to International Telephone and Telegraph Corporation. High voltage transfer switch. 3,819,889, Cl. 200-48.00r.
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Malone, Billy C., to Lynes, Inc. Safety valve arrangement for controlling communication between the interior and exterior of a tubular mamber. 3,818,922, Cl. 137-70.000.
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Mantel Brothers (Proprietary) Limited: *See—*
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Marcade, Roque D., to Whirlpool Corporation. Dry sensor circuit with static discriminator for dryer. 3,818,603, Cl. 34-45.000.
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Marcus, Paul. Linear transfer injection blow molding. 3,819,314, Cl. 425-249.000.
Marforio, Nerino, to Virginio Rimoldi & C.S.p.A. One-direction rotating blade for sewing machines cutters. 3,818,851, Cl. 112-130.000.
Marianne, Custazzo: *See—*
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Mark-Tex Corporation: *See—*
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Markfelt, Reinhold S., to Universal Oil Products Company. Mixing apparatus. 3,819,157, Cl. 259-4.000.
Marks, Harlen L.; and Ritter, Norman C., to Minnesota Mining and Manufacturing Company. Cushion flange reel. 3,819,124, Cl. 242-71.800.
Maron, Edmund, to Aktiengesellschaft Adolph Saurer. Valve for heating systems. 3,818,941, Cl. 137-625.400.
Maroschak, Ernest J., to Plastic Tubing, Inc. Method of making and processing corrugated plastic pipe. 3,819,778, Cl. 264-40.000.
Marouby, Guy, to Societe Anonyme D.B.A. Electronic antiskid braking system. 3,819.237, Cl. 303-21.0be.
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Martin, Frank S.; and Little, James F., to Uniroyal Inc. Process for molding plastic-covered golf balls. 3,819,795, Cl. 264-248.000.

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Maschinenfabrik R. Wolf Aktiengesellschaft: *See—*
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Massengale, John T.; and Koch, Walter T., to FMC Corporation. Method of preparing shirred, elastic, flexible articles. 3,819,401, Cl. 117-85.000.

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Mattson, Gerald H., to Pollution Control Products, Inc. Process for preparing lithium borohydride in an ether solution comprising lithium aluminum hydride and aluminum hydride. 3,819,808, Cl. 423-286.000.

Matui, Sei, to Nippon Kogaku K.K. Eye-level and waist-level viewfinder. 3,819,255, Cl. 350-286.000.

Matzek, Norman E.; and Musinski, Donald F., to Dow Chemical Company, The. Aluminum hydride in hexagonal or rhombohedral crystalline form. 3,819,819, Cl. 423-645.000.

Maverick Industries, Incorporated: *See—*
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Mavrovic, Ivo. Apparatus for prilling urea. 3,819,310, Cl. 425-6.000.

Max-Coater Co., Ltd.: *See—*
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Max-Planck Gesellschaft zur Forderung der Wissenschafter e.V. Gottingen: *See—*
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May, Dale S. Model and support stand therefor. 3,818,630, Cl. 46-131.000.

May, Edwin Richard Wells, to National Research Development Corporation. Production of silicon nitride material components. 3,819,786, Cl. 264-63.000.

Mayer, Cornelius; and Burkhart, Rolf, to Werkzengmaschinenfabrik Oerlikon-Buhrle AG. Armored vehicle with a laterally alignable mortar. 3,818,794, Cl. 89-40.00a.

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McCaleb, Stanley B., to Sun Oil Company (Delaware). Repulsing clays on drill bits. 3,818,996, Cl. 175-57.000.

McCarthy, Jeremiah P.; and Salmre, William, to GTE Laboratories Incorporated. Matrix employing semiconductor switching circuit. 3,819,867, Cl. 179-18.0gf.

McCaulay, David A., to Standard Oil Company. Alkylation of heptanes with isobutane using antimony pentafluoride-fluorosulfonic acid mixtures. 3,819,743, Cl. 260-683.470.

McCaulay, James Lindsay; and Dunks, Clifford Matthew, to Materials and Methods Limited. Process for the treatment of molten metals. 3,819,365, Cl. 75-130.00r.

McClelland, James F. Construction for discharging articles from inclined storage lanes. 3,819,023, Cl. 193-40.000.

McClintock, Bruce: *See—*
Kraus, Max H.; Baccellieri, Michael P.; and McClintock, Bruce, 3,818,762.

McClure, Edgar M., to Scientific Components, Inc. Changeable tip tweezers and the like. 3,818,784, Cl. 81-43.000.

McConnaughay, Kenneth E. Method of making a pavement. 3,819,291, Cl. 404-75.000.

McCormack, John J.: *See—*
Burt, Glenn R.; Condo, Albert C.; Eliason, Kay E.; and McCormack, John J., 3,818,712.

McCoy, Bobby Ray, to Procter & Gamble Company, The. Anhydrous hair treating product containing a monopersulfate salt. 3,819,828, Cl. 424-71.000.

McCrackin, Lonnie L.: *See—*
Tacke, William H.; Ormiston, Robert B.; and McCrackin, Lonnie L., 3,819,245.

McCulloch Corporation: *See—*
Smith, Stephen Hagar, 3,820,000.

McDonel, James D.: *See—*
Hauser, Ambrose A.; Eckert, Terry T.; and McDonel, James D., 3,819,295.

McEdwards, James A.: *See—*
Thorel, John P.; and McEdwards, James A., 3,819,478.

McEwan, James. Grinding wheel adapter. 3,818,645, Cl. 51-168.000.

McGraw-Edison Company: *See—*
Jawelak, Melbourne G.; and Boni, Richard R., 3,819,893.

McGunigle, Richard D. Tracking system for time-displaced signals. 3,819,919, Cl. 235-151.340.

McIntyre, Matthew; and Hadley, Richard M., to Jervis Corporation. Remote control rearview mirror. 3,818,780, Cl. 74-501.00m.

McKague, Allan B.; DeWaal, William; and VanWinckel, Carl E., to VanWinckel, Carl E.; d/b/a and said McKague and said Waal assors. to said Orchem Research Company, The. Production of alkoxy phenolic compounds. 3,819,719, Cl. 260-613.00d.

McKinley, Ronnie Jack, to Halliburton Company. Precision voltage control monostable multivibrator. 3,820,029, Cl. 328-58.000.

McMillin, John V., to Westinghouse Learning Corporation. Background reference level system and method for document scanners. 3,820,068, Cl. 340-146.3ag.

McNeil Corporation: *See—*
Pamer, Karl A., 3,819,219.
Smith, Thomas W., 3,819,915.

McNulty, Patrick J.; Swithenbank, Colin; Viste, Kenneth L.; and Von Meyer, William C., to Rohm & Haas Company. Herbicidal 2-aryl-4,4-dialkylm5-halomethylene-oxazolines. 3,819,355, Cl. 71-88.000.
McPhail, Hazel M.: *See—*
McPhail, William B.; and McPhail, Hazel M., 3,819,184.
McPhail, William B.; and McPhail, Hazel M. Board game apparatus. 3,819,184, Cl. 273-131.0ba.
McPherson, Alexander W.: *See—*
Sendoykas, Jack J.; and McPherson, Alexander W., 3,819,171.
McRowe, Arthur W., to Goodrich, B. F., Company, The. Flame retardant polyvinylchloride compositions. 3,819,577, Cl. 260-45.75c.
Mearl Corporation, The: *See—*
Pinsky, Jules; Rieger, Carl J.; and Hokanson, Elmer N., 3,819,566.
Meco Metal Finishing Engineers N.V.: *See—*
Meuldijk, Pieter W.; and Roodnat, Ben J., 3,819,502.
Medal, Richard J.: *See—*
Singhi, Dilip T.; and Medal, Richard J., 3,819,870.
Meddaugh, Gard E., to Varian Associates. Microwave automatic frequency control circuit. 3,820,035, Cl. 328-233.000.
Medical Concepts Inc.: *See—*
Deaton, David W., 3,818,896.
Medical Products Corporation: *See—*
Goldberg, Edward M.; Bazell, Seymour; and Ostensen, Ralph G., 3,818,511.
Medowski, Glenn O.: *See—*
Argyle, John F.; Medowski, Glenn O.; Ports, David W.; and Sutch, Richard D., 3,819,785.
Megadiamond Corporation: *See—*
Pope, Bill J., 3,819,814.
Megerle, George H.: *See—*
Berger, Frank J.; and Megerle, George H., 3,819,827.
Meguro, Kanji; Miyano, Hiroshi; Kuwada, Yutaka; Henmi, Teruji; and Yamano, Togo, to Takeda Chemical Industries, Ltd. 4-Phenyl-3-thioazylaminoquinolines. 3,819,634, Cl. 260-283.00s.
Mehta, Nariman B., to Burroughs Wellcome Co. Meta chloro substituted-α-butylamino propiophenones. 3,819,706, Cl. 260-570.50c.
Meinharde, Helmut W.: *See—*
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Meisei Chemical Works, Ltd.: *See—*
Kuwayama, Hiroji; Kajita, Hiroyuki; Asayama, Tadashi; and Nishio, Nobuyuki, 3,819,327.
Meisenbach, William T.: *See—*
Adams, George R.; and Meisenbach, William T., 3,819,010.
Meji Seika Kaisha, Ltd., mesne: *See—*
Umezawa, Sumio; Machida, Isamu; Shiotsu, Susumu; Yokota, Kimio; Makino, Shigehide; Kawaguchi, Gaku; and Honda, Kazutoshi, 3,819,834.
Mellen, Alice Marian: *See—*
Mellen, William F., 3,818,995.
Mellen, William F., to Mellen, Alice Marian. Two way plow with articulated center wheel and automatically lockable rear wheel. 3,818,995, Cl. 172-212.000.
Melugin, Joe F.; and O'Brien, David E., III, to United States of America, National Aeronautics and Space Administration. Technique for recovery of voice data from heat damaged magnetic tape. 3,819,440, Cl. 156-94.000.
Memmel, Manfred, to SKF Industrial Trading and Development Company. Slide bearings and journals. 3,819,241, Cl. 308-3.00r.
Menasco Manufacturing Co., and Miner Enterprises, Inc.: *See—*
Kendall, Giles A.; and Wallace, William D., 3,819,060.
Mera, Masashi: *See—*
Takano, Tadayoshi; Kurita, Masaru; Nikaido, Hiroo; Mera, Masashi; Konishi, Nobukiyo; and Okui, Ritsuko, 3,819,623.
Merck & Co., Inc.: *See—*
Christensen, Burton G.; Pollak, Peter I.; and Wendler, Norman L., 3,819,676.
Shen, Tsung-Ying; Fordice, Michael W.; Ruyle, William V.; and Jensen, Norman P., 3,819,603.
Shen, Tsung-Ying; and Jones, Howard, 3,819,716.
Merkel, Hans; and Wolf, Hans-Jochen, to Siemens Aktiengesellschaft. Method for the manufacture of dislocation-free, single-crystal gallium arsenide rod. 3,819,421, Cl. 148-1.600.
Merrigan, Frank: *See—*
Coale, Thomas E.; Gunn, Sidney W.; Merrigan, Frank; and Tompkins, Donald M., 3,818,832.
Merriman, Burt Trosey, Jr.: *See—*
Welstead, William John, Jr.; and Merriman, Burt Trosey, Jr., 3,819,641.
Merryman, Jerry D.: *See—*
Kilby, Jack S.; Merryman, Jerry D.; and Van Tassel, James H., 3,819,921.
Messick, Mikel Jay: *See—*
Hughes, Ronald W.; Messick, Mikel Jay; and Volpe, John Rodgers, 3,819,956.
Messinger, Norman A., to Narco Scientific Industries, Inc. Minimum reliable signal indicator for aircraft. 3,820,026, Cl. 325-364.000.
Metal Closures Limited: *See—*
Herbert, James Frederick, 3,818,677.
Metallgesellschaft Aktiengesellschaft: *See—*
Schutz, Erich, 3,818,971.
Metalume Manufacturing Company, Inc.: *See—*
Winans, Roy J., 3,818,666.
Metco, Inc.: *See—*
Ingham, Herbert Smith, Jr.; and Novinski, Edward Robert, 3,819,384.
Method of manufacturing integrated magnetic memories: *See—*
Ponnet, Robert; and Thomson-CSF, 3,819,341.
Meuldijk, Pieter W.; and Roodnat, Ben J., to Meco Metal Finishing Engineers N.V. Line- and spotplating machine. 3,819,502, Cl. 204-206.000.
Meurer, Engelbert, to Leybold-Heraeus-Verwaltung GmbH. Apparatus for demonstrating the critical temperature of a fluid. 3,818,614, Cl. 35-19.00r.
Meyer, Burton C., to Glass, Marvin, & Associates. Hair management or styling implement. 3,818,916, Cl. 132-85.000.
Meyer, Gerhard: *See—*
Worbs, Ernst; Magerlein, Helmut; and Meyer, Gerhard, 3,819,651.
Meyerson, Stanley. Buckle construction for straps, and the like. 3,818,548, Cl. 24-170.000.
Michihara, Takehiko: *See—*
Ogawa, Kiyoshi; Koyama, Seiji; and Michihara, Takehiko, 3,819,638.
Micklewright, Donald G.: *See—*
Baldwin, Richard H.; Burney, Donald E.; Towle, Philip H.; and Micklewright, Donald G., 3,819,659.
Micromation Systems, Inc.: *See—*
Butts, William O., 3,820,076.
Microsystems International Limited: *See—*
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Midland-Ross Corporation: *See—*
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Mikhailu, Georgy Ivanovich: *See—*
Kozorezov, Konstanti Isaakovich; Semchenko, Vitaly Vasilievich; Biteryakov, Viktor Vasilievich; Mikhailu, Georgy Ivanovich; and Skugorova, Ninel Fedorovna, 3,819,890.
Milano, Dominic C.: *See—*
Hopper, Paul J.; Kleinpeter, Jack D.; and Milano, Dominic C., 3,818,516.
Miles, Donald L.: *See—*
Charles, Harry R.; and Miles, Donald L., 3,819,423.
Miles Laboratories, Inc.: *See—*
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Millard, William Harry: *See—*
Doe, Ernest Edward; and Millard, William Harry, 3,818,932.
Miller, Gerald K.; Bull, Dale L.; and Rautiola, Norman A., to Nartron Corporation. Push button switch. 3,819,891, Cl. 100-67.00d.
Miller, Glenn G. Multiple cable block. 3,819,154, Cl. 254-134.3pa.
Miller, Paul J., to Weatherhead Company, The. Dual brake system. 3,818,804, Cl. 92-23.000.
Miller, Robert N. Audio transcriber for transmitting to and receiving from the ear canal. 3,819,860, Cl. 179-1.00p.
Million, Adolf: *See—*
Berinde, Vasile; Million, Adolf; Greavu, Nicolae; and Million, Carol, 3,819,901.
Million, Carol: *See—*
Berinde, Vasile; Million, Adolf; Greavu, Nicolae; and Million, Carol, 3,819,901.
Mills, Truett P. Hosel-iess wood type golf club. 3,819,181, Cl. 273-80.200.
Milotich, Francis J., to General Electric Company. Waste treatment system. 3,819,053, Cl. 210-108.000.
Minemura, Norihiro: *See—*
Shimauchi, Shiro; Minemura, Norihiro; Matsui, Takesha; Ito, Kenji; Shima, Takeo; and Oshima, Masataka, 3,819,326.
Minnesota Mining and Manufacturing Company: *See—*
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Burleigh, Malcolm B., 3,819,664.
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Marks, Harlen L.; and Ritter, Norman C., 3,819,124.
Moxness, James G., 3,819,130.
Newman, Norman; and Eisch, Richard S., 3,819,372.
Taylor, Charles W.; and Chang, Robert W. H., 3,819,568.
Minnesota Mining Manufacuring Company: *See—*
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Minolta Camera Kabushiki Kaisha: *See—*
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Mishima, Fumiyuki: *See—*
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Mitchell, Harry R.: *See—*
Bubniak, William C.; Huellmantel, Louis W.; and Mitchell, Harry R., 3,818,933.
Mitchell, William Eric, to Dunlop Limited. Method of making vehicle wheels. 3,818,565, Cl. 29-159.010.
Mitsubishi Denki Kabushiki Kaisha: *See—*
Enomoto, Tatsuya; and Morita, Hiroshi, 3,819,952.
Fujio, Yoshio, 3,819,874.
Kinase, Kadeo; Higuchi, Akiyoshi; and Inokuma, Akira, 3,819,011.

Ueda, Atsushi; and Ishii, Mitsuaki, 3,819,949.
Yamashita, Hiroshi; and Ishizaka, Michihiro, 3,820,106.

Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
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Mitsubishi Paper Mills, Ltd.: *See—*
Ohyama, Yasushi; and Sumitani, Hideo, 3,819,379.

Mitsubishi Petrochemical Co., Ltd.: *See—*
Hasama, Yoshifumi; and Ito, Ryoichi, 3,819,784.
Morisawa, Takao, 3,819,556.
Yasima, Teturo; Morisawa, Takao; Tazawa, Eiichi; and Tsuruta, Yasuhiko, 3,819,565.

Mitsuhashi, Masakazu: *See—*
Okada, Shigetaka; Tsuyama, Naoto; Mitsuhashi, Masakazu; and Ogasawara, Junsuke, 3,819,484.

Mitsui Mining & Smelting Co. Ltd.: *See—*
Tachimori, Hironori; Nagahori, Teiji; and Nakamura, Yukio, 3,819,406.
Yoshida, Yoshinaga; Kobayashi, Shigehiko; Miyazaki, Kazuhide; Yamamoto, Michiaki; and Seki, Yasuo, 3,819,334.

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Miyachi, Tsuncharu: *See—*
Iijima, Hiroshi; Inamoto, Kinya; Fukuda, Shuzo; Shimoma, Takashi; and Miyachi, Tsuneharu, 3,819,948.

Miyakawa, Seinan, to Asahi Kohaku Kogyo Kabushiki Kaisha. Electric camera shutter with manual controls. 3,820,125, Cl. 354-10.0ct.

Miyamoto, Shoji: *See—*
Onishi, Akira; Irako, Koichi; Iseda, Yutaka; Hayakawa, Yoshihiro; Kawagoe, Takahiro; and Miyamoto, Shoji, 3,819,590.

Miyano, Hiroshi: *See—*
Meguro, Kanji; Miyano, Hiroshi; Kuwada, Yutaka; Henmi, Teruji; and Yamano, Togo, 3,819,634.

Miyazaki, Kazuhide: *See—*
Yoshida, Yoshinaga; Kobayashi, Shigehiko; Miyazaki, Kazuhide; Yamamoto, Michiaki; and Seki, Yasuo, 3,819,334.

Mizokami, Nariakira: *See—*
Horii, Satoshi; Mizokami, Nariakira; Fujino, Masahiko; Shinagawa, Susumu; Ochiai, Michihiko; and Okutani, Tetsuya, 3,819,619.

Mizunuma, Tsutomu: *See—*
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Mobil Oil Corporation: *See—*
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Peiser, Alfred M.; and De Pasquale, Matthew J., 3,819,511.
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Mochizuki, Haruo: *See—*
Ozeki, Kazuya; Mochizuki, Haruo; and Sasahara, Hiroaki, 3,819,868.

Mochizuki, Noritaka: *See—*
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Mochizuki, Yoshinari: *See—*
Iizuka, Tokutaro; and Mochizuki, Yoshinari, 3,819,201.

Moder, Hans-Ulrich: *See—*
Giebler, Fritz; Moder, Hans-Ulrich; Rabold, Jurgen; and Schaffer, Bernhard, 3,820,077.

Moertel, George B.: *See—*
Johnston, James R.; and Moertel, George B., 3,818,575.

Moertel, George B., to Textron Inc. Slider for a slide fastener. 3,818,549, Cl. 24-205.15r.

Moldex, Inc.: *See—*
Paine, Ellis Howard, 3,819,437.

Molitor, Robert P., to Questor Corporation. Golf ball cover compositions comprising a mixture of iomomer resins. 3,819,768, Cl. 260-897.00b.

Molyneux, Lindsay. Determination of the orientation of magnetism in a sample of material. 3,820,012, Cl. 324-14.000.

Monarch Road Machinery Company: *See—*
Jackoboice, Edward J.; Jackoboice, Edward W.; and Lruizenga, Gerritt H., 3,818,936.

Monch, Heinz: *See—*
Giesselmann, Gunter; Monch, Heinz; Schreyer, Gerd; and Weiberg, Otto, 3,819,818.

Monkovic, Ivo: *See—*
Pachter, Irwin J.; Belleau, Bernard R.; and Monkovic, Ivo, 3,819,635.

Monnee, Hugo C. W.: *See—*
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Monsanto Company: *See—*
Campbell, Robert Henry; Rader, Charles Phillip; and Wright, Robert Lee, 3,819,399.
Dixon, William D., 3,819,751.
Funk, Paul M.; Legg, Billy J.; and Baldwin, Richard W., 3,819,585.

Montana, Francis J.; and Pawlik, James A., to Valeron Corporation, The. Cut-off saw and slotting cutter. 3,818,561, Cl. 29-95.00r.

Montecatini Edison S.p.A.: *See—*
Chan, Pierre Edouard, 3,819,537.
Ferrari, Giuseppe; and Griselli, Pier Luigi, 3,819,727.

Moore, Arthur D., to Microsystems International Limited. Polarity guard. 3,819,951, Cl. 307-202.000.

Moore, Colin. Metal treatment. 3,819,428, Cl. 148-125.000.

Moore, Colin; and Thornton, Michael Joseph, to Imperial Chemical Industries Limited. Separating adipontrile from mixtures. 3,819,491, Cl. 203-29.000.

Moore, John J., Sr. Gusset. 3,818,672, Cl. 281-189.36h.

Moore, Robert David, Jr. Heatronic valves. 3,818,980, Cl. 165-32.000.

Moore, Robert E.; and Driscoll, Gary L., to Sun Research and Development Co., mesne. Preparation of haloadamantanes. 3,819,721, Cl. 260-617.00f.

Moorhead, Seth B., Jr., to Martin Marietta Corporation. Thrust vector-jet interaction vehicle control system. 3,819,117, Cl. 239-265.230.

Mori Denki Manufacturing Co., Ltd.: *See—*
Mori, Shinjiro, 3,819,141.

Mori, Kazumasa: *See—*
Itoh, Katumi; Mori, Kazumasa; and Iwaki, Katsutaro, 3,820,009.

Mori, Shinjiro, to Mori Denki Manufacturing Co., Ltd. Device for assisting attachment of heavy and/or bulky article. 3,819,141, Cl. 248-223.000.

Morimoto, Akira; Kariyone, Kazuo; Kurita, Masaru; Hashimoto, Masashi; and Nishiwaki, Osamu, to Fujisawa Pharmaceutical Co., Ltd. 3-Substituted-thiomethyl-3-cephem-4-carboxylic acid derivatives. 3,819,621, Cl. 260-243.00c.

Morisawa, Takao: *See—*
Yasima, Teturo; Morisawa, Takao; Tazawa, Eiichi; and Tsuruta, Yasuhiko, 3,819,565.

Morisawa, Takao, to Mitsubishi Petrochemical Co., Ltd. Corrosion resistant processing. 3,819,556, Cl. 260-29.6ps.

Morita, Hiroshi: *See—*
Enomoto, Tatsuya; and Morita, Hiroshi, 3,819,952.

Morita, Shigeru: *See—*
Ohta, Kazuo; Kurita, Kentaro; and Morita, Shigeru, 3,820,048.

Morita, Yoshio. Fire disaster prevention system and a method to prevent loss of life. 3,818,635, Cl. 49-2.000.

Morjan, Jean, to Etablissements J. B. Gabriels S.P.R.L. Metallic packages for the distribution of beer under pressure. 3,819,084, Cl. 220-64.000.

Moro, Dominik J., to American Chain & Cable Company, Inc. Apparatus for positioning journal assemblies in pulverizers. 3,818,567, Cl. 29-200.00d.

Moroto, Kaoru; and Suzuki, Isao, to Zenkosha Tokie Kabushiki Kaisha. Time delay switch device. 3,819,885, Cl. 200-35.00r.

Morrison, William McKenzie Meek. Valve actuators. 3,819,147, Cl. 251-14.000.

Morrow, Duane Lloyd: *See—*
Wirt, Leslie Spencer; and Morrow, Duane Lloyd, 3,819,007.

Mortensen, Kjell Sverre, to Sverre Munck A/S. Buffer arrangement. 3,819,014, Cl. 188-1.00b.

Morton, John; Stevens, Keith Drummond; and Thexton, Graham Spencer. Cableform Limited Control circuits for D.C. electric motors. 3,819,997, Cl. 318-258.000.

Morton, William D., Jr., to Delta Design Inc. Mechanical Drive module. 3,818,838, Cl. 104-168.000.

Morton-Norwich Productd, Inc., mesne: *See—*
Kaestner, Erwin A.; and Spink, John, 3,819,329.

Moss, Charles W., to Tension Structures, Inc. Flexible joint. 3,818,669, Cl. 52-582.000.

Motion Manufacturing Inc.: *See—*
Sievers, Robert W., 3,818,770.

Motorola, Inc.: *See—*
Bowman, Ronald R., 3,819,433.
Hedges, Walter Paul, 3,819,862.
Huber, William B., 3,820,160.

Motsinger, Russell E., to General Electric Company. Duct wall acoustic treatment. 3,819,009, Cl. 181-33.00g.

Mottel, Alan, to Consolidated Novelty Co., Inc. Artificial christmas tree having erectable limbs. 3,819,457, Cl. 161-14.000.

Mounts, Lewis S.: *See—*
Tigner, Ruben A.; and Mounts, Lewis S., 3,818,769.

Mouri, Mineju; and Aoki, Katsuhiko, to Fuji Electric Company Limited. Displacement-electric signal converter. 3,820,094, Cl. 340-199.000.

Moxness, James G., to Minnesota Mining and Manufacturing Company. Four-reel magnetic tape cartridge. 3,819,130, Cl. 242-199.000.

M.U. Engineering & Mfg., Inc.: *See—*
Skinner, James R., 3,819,055.

Mueller Co.: *See—*
Leopold, Wilbur R., Jr., 3,819,207.

Mueller, Herbert: *See—*
Pommer, Horst; Mueller, Herbert; and Overwien, Hermann, 3,819,713.

Mueller, Kurt Hugo, to Bell Telephone Laboratories, Incorporated. Fast start-up system for automatic transversal equalizers. 3,820,042, Cl. 333-18.000.

Mukavitz, David R.: *See—*
Bushaw, Wayne; Halliday, Adam T.; Mukavitz, David R.; and Loan, Richard L., 3,819,362.

Mules, Richard D. Method of making polymeric film. 3,819,775, Cl. 264-40.000.

Muller, Gerhard: *See—*
Schumichen, Helmut; and Muller, Gerhard, 3,819,385.

Muller, Hans. Turbidity measuring device with means for preventing the formation of bubbles. 3,819,278, Cl. 356-208.000.

Muller, Jacques, to Ebauches Tavannes S.A. Digital display mechanism for a time-keeper. 3,818,689, Cl. 58-5.000.

Muller, Norbert: *See*—
Dassler, Rudolf; Dreier, Horst; Strickle, Erich; and Muller, Norbert, 3,818,617.

Muller, Thomas P.; and Popdan Gary L., to Caterpillar Tractor Co. Brake assembly for excavator swing transmission. 3,819,018, Cl. 192-8.00r.

Muller-Scherak, Wolf Georg. Combination beach bag and inflatable mattress. 3,818,962, Cl. 150-1.000.

Mullersman, Ferdinand H., to General Electric Company. Emergency lighting system. 3,819,980, Cl. 315-86.000.

Munchbach, Curt; and Weber, Hans, to Irma Ungerer. Apparatus for straightening metal strips. 3,818,739, Cl. 72-163.000.

Murai, Koichi; Akazome, Giichi; Kyuma, Tatsuo; and Nakazawa, Mikio, to New Japan Chemical Company Limited. Synthesis of N-methylaniline. 3,819,709, Cl. 260-577.000.

Murakami, Yoshiaki: *See*—
Shimomura, Takatoshi; Nagata, Hideo; Murakami, Yoshiaki; Sanno, Haruyoshi; and Inoue, Tadanori, 3,819,767.

Murao, Sawao; Satoi, Shuzo; Kuwana, Noriaki; Fukumura, Masayuki; and Kawamura, Tamio, to Eisai Co., Ltd. Process for the preparation of pepsin inhibitors. 3,819,486, Cl. 195-80.000.

Murchison, Craig B.; Bailey, Robert E.; and Diesen, Ronald W., to Dow Chemical Company, The. Treatment of aqueous solutions contaminated with soluble organic materials. 3,819,516, Cl. 210-63.000.

Murphy, Donald P., to Oxy Metal Finishing Corporation. Imidazole stripping composition and method. 3,819,529, Cl. 252-156.000.

Murphy, James L., Jr.: *See*—
Rogers, Rudy E.; and Murphy, James L., Jr., 3,819,336.

Murphy, Thomas F. Perforated golf putter. 3,819,180, Cl. 273-80.00c.

Murray, Joseph John, to Potter Instrument Company, Inc. Simplified method for bonding ferrite cores. 3,819,348, Cl. 65-36.000.

Musinski, Donald F.: *See*—
Matzek, Norman E.; and Musinski, Donald F., 3,819,819.

Mylee Digital Sciences, Inc.: *See*—
Abrams, Harold B.; Haynes, Benjamin O.; and Williams, Glynn P., 3,820,080.

Myles, Walter E., to Singer Company, The, mesne. Visual system for rotary-wing aircraft. 3,818,612, Cl. 35-12.00n.

N L Industries, Inc., mesne: *See*—
Yankee, Herbert L.; and Corrette, Richard H., 3,818,749.

N. V. Hollands Signaalapparaten: *See*—
Gellekink, Bernard; and Clemens, Theodorus Albertus, 3,820,113.

Nabisco, Inc.: *See*—
Griner, Arthur J., 3,818,675.

Nagahori, Teiji: *See*—
Tachimori, Hironori; Nagahori, Teiji; and Nakamura, Yukio, 3,819,406.

Nagai, Hidetaka; Sato, Eiichi; and Kobayashi, Fujio, to Kowa Company, Ltd. Diagnostic agent for detection of primary hepatoma. 3,819,822, Cl. 424-8.000.

Nagao, Kameji: *See*—
Yamamoto, Nobuo; Nagao, Kameji; and Horie, Ikutaro, 3,819,608.

Nagata, Hideo: *See*—
Shimomura, Takatoshi; Nagata, Hideo; Murakami, Yoshiaki; Sanno, Haruyoshi; and Inoue, Tadanori, 3,819,767.

Nagayama, Masuzo: *See*—
Okumura, Osamu; Sakatani, Takenobu; and Nagayama, Masuzo, 3,819,718.

Nagayama, Shuichi: *See*—
Kunii, Takao; Tanaka, Teruaki; Kanaya, Sadaaki; and Nagayama, Shuichi, 3,819,975.

Naka, Hiroshi: *See*—
Takahashi, Saburo; Oyama, Hiroshi; Naka, Hiroshi; Yamamoto, Takaji; Nakatomi, Kentaro; Ishibe, Kouichi; and Saito, Toshihiro, 3,819,701.

Nakada, Tetsuo; Ozaki, Yoshiaki; and Mishima, Fumiyuki, to Janome Sewing Machine Co., Ltd. Credit card printing machine. 3,818,828, Cl. 101-269.000.

Nakai, Tetsuzp: *See*—
Suenaga, Masanobu; Machii, Tetsuo; Sawano, Takahiro; Kobayashi, Takehiko; Dengo, Tadao; and Nakai, Tetsuzp, 3,818,584.

Nakajima, Rokuro: *See*—
Tabata, Hisanobu; Tabata, Norimasa; and Nakajima, Rokuro, 3,819,803.

Nakajima, Shigeo, to Taiheiyo Coal Mining Co., Ltd. Coal rising device for use in a face conveyor. 3,819,031, Cl. 198-172.000.

Nakajima, Tama: *See*—
Tabata, Hisanobu; Tabata, Norimasa; and Nakajima, Rokuro, 3,819,803.

Nakamura, Kenya; and Kuroyanagi, Makoto, to Nipponsenso Co., Ltd. Heat exchanger. 3,818,984, Cl. 165-166.000.

Nakamura, Kihei; Yamazaki, Harumichi; and Kondo, Yoshikazu, to Bridgestone Tire Company Limited. Buffering device. 3,819,167, Cl. 267-139.000.

Nakamura, Yukio: *See*—
Tachimori, Hironori; Nagahori, Teiji; and Nakamura, Yukio, 3,819,406.

Nakane, Hisashi; and Uehara, Akira, to Tokyo Ohka Kogyo Co., Ltd. Low temperature plasma incinerator and method of stabilizing impedance therein. 3,818,845, Cl. 110-8.00e.

Nakata, Bruce Tadashi; and Wilhoit, Eugene Dennis, to Du Pont de Nemours, E. I., and Company. Process for dichlorobutene isomerization. 3,819,730, Cl. 260-654.00r.

Nakatomi, Kentaro: *See*—
Takahashi, Saburo; Oyama, Hiroshi; Naka, Hiroshi; Yamamoto, Takaji; Nakatomi, Kentaro; Ishibe, Kouichi; and Saito, Toshihiro, 3,819,701.

Nakazawa, Mikio: *See*—
Murai, Koichi; Akazome, Giichi; Kyuma, Tatsuo; and Nakazawa, Mikio, 3,819,709.

Nalle, Alan W. Apparatus for making inflated plastic mesh. 3,819,451, Cl. 156-433.000.

Nalley, David J.: *See*—
Seely, Robert W.; and Nalley, David J., 3,818,778.

Napko Corporation: *See*—
Gindrup, Wayne; and Siegmund, Alfred J., Jr., 3,819,564.

Nara, Takashi; Takasawa, Seigo; Okachi, Ryo; Kawamoto, Isao; Kumakawa, Masaru; Yamamoto, Mitsuyoshi; and Sato, Seiji, to Abbott Laboratories. Process for producing spectinomycin. 3,819,485, Cl. 195-80.00r.

Narayanan, Venkatachala Lakshmi: *See*—
Haugwitz, Rudiger Dieter; and Narayanan, Venkatachala Lakshmi, 3,819,618.

Narco Scientific Industries, Inc.: *See*—
Messinger, Norman A., 3,820,026.

Naremco, Inc.: *See*—
Rollins, Forrest Theodore; Kubovich, Frank Steve; Buess, Kenneth Benning; and Hartzell, Donald Joseph, 3,818,673.

Nartron Corporation: *See*—
Miller, Gerald K.; Bull, Dale L.; and Rautiola, Norman A., 3,819,891.

Nash, Donald Henry: *See*—
Blahut, Donald Edgar; Friedman, Stanley Joel; and Nash, Donald Henry, 3,819,877.

National Distillers and Chemical Corporation: *See*—
Kuckro, Gerard W.; and Lorand, George E., 3,819,410.

National Petro Chemicals Corporation: *See*—
Aboutboul, Henri A.; Krekeler, Jerome H.; and Kirch, William, 3,819,811.

National Research Development Corporation: *See*—
Bates, James John, 3,818,588.
May, Edwin Richard Wells, 3,819,786.
Scurlock, Ralph Geoffrey, 3,818,715.
Velmans, Max Leopold, 3,819,875.

National Steel Corporation: *See*—
DeCaro, David P.; and Gronceski, Gerald A., 3,819,426.

Natori, Machito, to Kabushiki Kaisha Suwa Seikosha and Shinshu Seiki Kabushiki Kaisha. Motion transforming mechanism. 3,818,773, Cl. 74-112.000.

Nauman, Mark R.: *See*—
Powell, Mabrin P.; and Nauman, Mark R., 3,819,398.

Nawn, John F.: *See*—
Daniel, Leonard Irving; Sadler, Thomas H.; Nawn, John F.; and French, David Walter, 3,819,210.

Neal, David Lynn, to RCA Corporation. Television receiver service adjustment system. 3,820,155, Cl. 358-10.000.

Neau, Eugene L.; and Van Hook, Arthur R., to United States of America, Atomic Energy Commission. Electromechanical shutter. 3,820,144, Cl. 354-234.000.

Negishi, Hirokazu: *See*—
Komiya, Takao; Ihara, Takashi; Matsuo, Takehiko; Tosaka, Umi; Negishi, Hirokazu; and Ohhara, Karsunobu, 3,819,370.

Nelson, Fred Eugene, to General Electric Company. Low noise dimmer for fluorescent lamps. 3,819,982, Cl. 315-94.000.

Nepela, Daniel A.; and Holmstrom, Fred E. Golf ball. 3,819,190, Cl. 273-232.000.

Nesson, Israel; Faris, Edwin E.; and Spezial, Ronald, to Berkey Photo, Inc. Latch assembly. 3,820,146, Cl. 354-288.000.

Neubauer, Joseph J. N.: *See*—
Condo, Albert C.; and Neubauer, Joseph J. N., 3,818,711.

Neumann, Robert M.: *See*—
Horn, Werner G.; and Neumann, Robert M., 3,819,311.

Neville, William E. Bifurcated tracheo-bronchial prostheses. 3,818,515, Cl. 3-1.000.

New Japan Chemical Company Limited: *See*—
Murai, Koichi; Akazome, Giichi; Kyuma, Tatsuo; and Nakazawa, Mikio, 3,819,709.

New York City Transit Authority, The: *See*—
Bush, Charles J., 3,819,114.

Newallis, Peter E.: *See*—
Poje, Albert J.; and Newallis, Peter E., 3,819,358.

Newcamp, Charles W.: *See*—
Opal, Kenneth E.; Kelly, Charles R.; Newcamp, Charles W.; Ley, William M.; and Pietkiewicz, Robert S., 3,819,992.

Newman, Henry C., to Canrad Precision Industries, Inc. Ultraviolet lamp housing. 3,819,929, Cl. 240-41.370.

Newman, James F., to Uniroyal, Inc. Pneumatic tire. 3,818,965, Cl. 152-209.00r.

Newman, Norman; and Eisch, Richard S., to Minnesota Mining and Manufacturing Company. Film element and method for production

of spatially distinct dye and silver photographic images. 3,819,372, Cl. 96t4.000.

Nickel, Bernd, to Siemens Aktiengesellschaft. Device for supervising the heart and breathing functions of a patient. 3,818,900, Cl. 128-2.06r.

Nicolaides, Ruth, to United States of America, Army. Temperature insensitive doped amorphous thin film switching and memory device. 3,820,150, Cl. 357-2.000.

Nielsen, Ole Bent T.: *See*—
Feit, Peter Werner; and Nielsen, Ole Bent T., 3,819,692.

Nigol, Olaf. High voltage electrical insulator having an insulator body the entire surface of which is covered by a semiconductive glaze. 3,819,851, Cl. 174-211.000.

Niizawa, Yoshiaki; Hirano, Reiji; and Ito, Matsutoshi, to Junichi, Kabushiki Kaisha. Sign display device. 3,820,107, Cl. 340-324.00r.

Nikaido, Hiroo: *See*—
Takano, Tadayoshi; Kurita, Masaru; Nikaido, Hiroo; Mera, Masashi; Konishi, Nobukiyo; and Okui, Ritsuko, 3,819,623.

Nikex Nehezipari Kulkereskedelmi Vallalat: *See*—
Praznovsky, Istvan; and Gyulavari, Imre, 3,819,512.

Nikles, Erwin, to Ciba-Geigy Corporation. Cyanoalkylamino phenylacarbamates. 3,819,678, Cl. 260-465.00d.

Nimerick, Kenneth H., to Dow Chemical Company, The. Method of treating subterranean formations with a composition of improved viscosity control. 3,818,991, Cl. 166-283.000.

Nippe, Waldemar; and Groppel, Dieter, to Siemens Aktiengesellschaft. Rechargeable metal electrode for storage batteries and metal-air cells. 3,819,413, Cl. 136-25.000.

Nippon Electric Co., Ltd.: *See*—
Kohara, Haruki, 3,820,091.

Nippon Electric Company, Limited: *See*—
Akiyama, Susumu, 3,820,036.
Kageyama, Takao, 3,819,977.
Ozeki, Kazuya; Mochizuki, Haruo; and Sasahara, Hiroaki, 3,819,868.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Isii, Sigeki, 3,819,844.
Okamoto, Shimaji, 3,819,843.

Nippon Hoso Kyokai: *See*—
Toyonage, Ryuya; and Hiruma, Eikyu, 3,819,408.

Nippon Kogaku K.K.: *See*—
Matui, Sei, 3,819,255.

Nippon Kokan Kabushiki Kaisha: *See*—
Iijima, Hiroshi; Inamoto, Kinya; Fukuda, Shuzo; Shimoma, Takashi; and Miyachi, Tsunehara, 3,819,948.
Inomata, Nobuhiro; Ohba, Eiji; and Ogiwara, Tomowo, 3,819,162.

Nippon Selfoc Kabushiki Kaisha: *See*—
Irie, Masanori, 3,819,782.

Nippondenso Co., Ltd.: *See*—
Ishihara, Shiya; and Suzuki, Yoshihiro, 3,819,308.
Itoh, Katumi; Mori, Kazumasa; and Iwaki, Katsutaro, 3,820,009.
Sugiura, Akio; and Okamoto, Atsutoshi, 3,820,004.
Yamaguchi, Terumoto; and Izumi, Kanemithi, 3,818,555.

Nipponsenso Co., Ltd.: *See*—
Nakamura, Kenya; and Kuroyanagi, Makoto, 3,818,984.

Nishi, Hidetoshi: *See*—
Kajiwara, Toshiyuki; Nishi, Hidetoshi; and Sonobe, Noriyoshi, 3,818,737.
Kajiwara, Toshiyuki; Sonobe, Noriyoshi; Nishi, Hidetoshi; and Hayashi, Masahiro, 3,818,743.

Nishio, Nobuyuki: *See*—
Kuwayama, Hiroji; Kajita, Hiroyuki; Asayama, Tadashi; and Nishio, Nobuyuki, 3,819,327.

Nishiwaki, Osamu: *See*—
Morimoto, Akira; Kariyone, Kazuo; Kurita, Masaru; Hashimoto, Masashi; and Nishiwaki, Osamu, 3,819,621.

Nishiyama, Kenji: *See*—
Tokumitsu, Ichiro; Takemura, Toshisada; Sugiyama, Minoru; Nishiyama, Kenji; Ogawa, Shigeo; and Okiyama, Sadao, 3,818,975.

Nissan Motor Company, Limited: *See*—
Oka, Takashi; Arima, Tatsuhiro; and Kimitsuka, Akira, 3,819,204.

Nissmo, Jim Arthur; and Sundin, Jan Axel, to Scan Coin AB. Coin feed mechanism. 3,818,918, Cl. 133-3.00h.

Nittinger, Russell H.; and Taylor, Donald O., to Allied Chemical Corporation. Drill shaft. 3,819,168, Cl. 267-141.000.

Noack, Walter E.: *See*—
Jones, Irby C., Jr.; and Noack, Walter E., 3,819,813.

Noba, Motoi: *See*—
Kuroyama, Toshinobu; Noba, Motoi; Fukuyama, Takahiko; and Teranishi, Nobuyuki, 3,819,928.

Noble, Peter M., to Westinghouse Air Brake Company. Controllable skate car retarder. 3,819,017, Cl. 188-62.000.

Noguchi, Masaru, to Alps Motorola, Inc. Motor with integral constant torque clutch. 3,819,966, Cl. 310-74.000.

Noiles, Douglas G.; and Bryan, Graham W., to United States Surgical Corporation. Surgical stapling instrument. 3,819,100, Cl. 227-19.000.

Noll, Walter: *See*—
Buchner, Werner; Noll, Walter; and Bressel, Bernd, 3,819,744.
Rudolph, Karl-Heinz; Buchner, Werner; and Noll, Walter, 3,819,674.

Nomura, Katsuhiko; Uno, Naoyuki; Sakazaki, Tadazumi; Watanabe, Koichiro; and Urano, Fumio, to Asahi Kogaku Kogyo Kabushiki Kaisha. Shutter release means in a single lens reflex camera having an automatic exposure time control of inner light measuring syste. 3,820,139, Cl. 354-152.000.

Noodleman, Samuel, to Kollmorgen Corporation. Commutating structure for D.C. permanent magnet machines. 3,819,964, Cl. 310-46.000.

Norback, Per Gunnar, to Aktiebolaget Carl Munters. Apparatus for corrugating a web of thin material such as paper, in a continuous process. 3,819,453, Cl. 156-459.000.

Nordson Corporation: *See*—
Crum, Gerald W.; Reighard, Allan B.; and Tamny, Simon Z., 3,818,930.
Hogstrom, Edwin F., 3,819,403.

Norris, Allan S.; and Craig, James T., to General Motors Corporation. Manual and automatic shift controls for transmissions. 3,818,783, Cl. 74-869.000.

North American Rockwell Corporation: *See*—
Sidbeck, Paul R.; and Weinstein, Daniel S., 3,819,902.

North, Howard C.; Calderwood, Gene C.; and Williamson, Charles W., to Esso Research and Engineering Company. Multi-step air ring for tubular film process. 3,819,790, Cl. 264-89.000.

Norton Company: *See*—
Vartanian, Haig; Postlethwaite, Alan W.; and Mao, Robert Y. L., 3,818,581.

Novak, Edward P., to Hoover Company, The. Control circuit for timed food heating device. 3,819,904, Cl. 219-492.000.

Novinski, Edward Robert: *See*—
Ingham, Herbert Smith, Jr.; and Novinski, Edward Robert, 3,819,384.

Nowak, Edmund, to Przedsiebiorstwo Doswiadczalne Pros Automahycznych Tlocznikow Pornar-Hydomct. Double-acting, casing frame hydraulic press. 3,818,825, Cl. 100-209.000.

Nuclear Radiation Development, Inc.: *See*—
Olson, Orval L.; and Radosavljevic, Dusan, 3,818,545.

Nudenberg, Walter: *See*—
Visser, Harry Dale; and Nudenberg, Walter, 3,819,592.

Nupla Corporation: *See*—
Carmien, Joseph Allen, 3,819,288.

Nystroem, Ernest Holger Bertil. Valve and dosage apparatus. 3,819,300, Cl. 417-90.000.

Oakville Wood Specialties Limited: *See*—
Burrell, Theodore Alexander, 3,818,572.

Oates, Alex N.; and Edmonds, James T., Jr., to Phillips Petroleum Company. High temperature resistant laminates. 3,819,407, Cl. 117-138.80n.

Oberto, Edwin L., to Burgess Vibrocrafters, Inc. Can opener with removable cutter assembly. 3,818,589, Cl. 30-4.00r.

Oblasti, Zhukovsky Moskovskoi: *See*—
Leonov, Oleg Borisovich; Arapov, Viktor Viktorovich; Pavljukov, Vladimir Grigorievich; Oblasti, Zhukovsky Moskovskoi; Patrakhaltsev, Nikolai Nikolaevich; Manuilov, Nikolai Nikolaevich, and Soldatov, Nikolai Konstantinovich, 3,818,882.

Obler, Henry D.; and Bauer, Hugh B., to United States of America, National Aeronautics and Space Administration. Air conditioning system and component therefor distributing air flow from opposite directions. 3,818,814, Cl. 98-39.000.

O'Brien, David E., III: *See*—
Melugin, Joe F.; and O'Brien, David E., III, 3,819,440.

O'Brien, John Leslie; Finnimore, Bryan; and Hogg, Dallas John Arthur. Pipe fittings. 3,818,862, Cl. 118-306.000.

Ochi, Shikanosuke, to Kabushiki Kaisha Sega Enterprises. Apparatus for defining a runway course of a running model. 3,819,178, Cl. 273-1.00e.

Ochiai, Michihiko: *See*—
Horii, Satoshi; Mizokami, Nariakira; Fujino, Masahiko; Shinagawa, Susumu; Ochiai, Michihiko; and Okutani, Tetsuya, 3,819,619.

O'Connor, Chadwell. Rotary boiler. 3,818,871, Cl. 122-11.000.

O'Connor, Leo A. Automobile door button-operating implement. 3,819,221, Cl. 294-19.00r.

O'Donnell, Thomas P.: *See*—
Farrow, Tom Jay; and O'Donnell, Thomas P., 3,818,682.

Oehler, Carl W. Special pallet type load transport apparatus. 3,819,076, Cl. 214-512.000.

Oesterhelt, Gerhard: *See*—
Winkler, Josef; and Oesterhelt, Gerhard, 3,819,418.

Oesterreichisch-Alpine Montangesellschaft: *See*—
Lindner, Hannes, 3,819,935.

Offutt, Carl R.; Janke, Donald Edward; and Marcade, Roque Denis, to Whirlpool Corporation. Termination logic and output suppression for integrated circuit dryer control. 3,818,604, Cl. 34-45.000.

Ogasawara, Junsuke: *See*—
Okada, Shigetaka; Tsuyama, Naoto; Mitsuhashi, Masakazu; and Ogasawara, Junsuke, 3,819,484.

Ogawa, Kiyoshi; Koyama, Seiji; and Michihara, Takehiko, to Teijin Limited. Method of making garments of knitted fabrics. 3,819,638, Cl. 264-292.000.

Ogawa, Masaya, to Minolta Camera Kabushiki Kaisha. Transfer type electrophotographic duplicating apparatus. 3,819,261, Cl. 355-14.000.

Ogawa, Shigeo: *See*—

Tokumitsu, Ichiro; Takemura, Toshisada; Sugiyama, Minoru; Nishiyama, Kenji; Ogawa, Shigeo; and Okiyama, Sadao, 3,818,975.
Ogiso, Mitsutoshi: *See—*
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Ogiwara, Tomowo: *See—*
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Ohashi Iron Works Co., Ltd.: *See—*
Ohashi, Isao, 3,819,302.
Ohashi, Isao, to Ohashi Iron Works Co., Ltd. Pump Particularly for bicycles. 3,819,302, Cl. 417-234.000.
Ohba, Eiji: *See—*
Inomata, Nobuhiro; Ohba, Eiji; and Ogiwara, Tomowo, 3,819,162.
Ohhara, Karsunobu: *See—*
Komiya, Takao; Ihara, Takashi; Matsuo, Takehiko; Tosaka, Umi; Negishi, Hirokazu; and Ohhara, Karsunobu, 3,819,370.
Ohta, Kazuo; Kurita, Kentaro; and Morita, Shigeru, to Hitachi, Ltd. Shielded conductor for disk windings of inductive devices. 3,820,048, Cl. 336-70.000.
Ohyama, Yasushi; and Sumitani, Hideo, to Mitsubishi Paper Mills, Ltd. Silver halide photographic material for use in color photography. 3,819,379, Cl. 96-68.000.
Oishi, Masayoshi, to Sun Research and Development Co. Dehydrocyclization of paraffins and catalyst therefor. 3,819,507, Cl. 208-139.000.
Oka, Takashi; Arima, Tatsuhiro; and Kimitsuka, Akira, to Nissan Motor Company, Limited. Safety device for motor vehicle. 3,819,204, Cl. 280-150.0ab.
Okachi, Ryo: *See—*
Nara, Takashi; Takasawa, Seigo; Okachi, Ryo; Kawamoto, Isao; Kumakawa, Masaru; Yamamoto, Mitsuyoshi; and Sato, Seiji, 3,819,485.
Okada, Shigetaka; Tsuyama, Naoto; Mitsuhashi, Masakazu; and Ogasawara, Junsuke, to Ken Hayashibara. Process for preparing sucrose-starch sweetener free from reducing sugar. 3,819,484, Cl. 195-31.004.
Okamoto, Atsutoshi: *See—*
Sugiura, Akio; and Okamoto, Atsutoshi, 3,820,004.
Okamoto, Shimaji, to Nippon Gakki Seizo Kabushiki Kaisha. Keyboard electronic music instrument with step-wise variable volume control responsive to key-touch. 3,819,843, Cl. 84-1.100.
Okamuro, James A., to Borroughs Tool & Equipment Corporation. Tube bender. 3,818,738, Cl. 72-149.000.
Okawa, Kazuyoshi: *See—*
Fushida, Yoshio; Suzuki, Kazuo; Kasahara, Kakaaki; Okawa, Kazuyoshi; and Ashizawa, Masayoshi, 3,819,025.
Okazaki, Kanzo: *See—*
Inai, Yuichi; Okazaki, Kanzo; Uchiyama, Mikio; Shimada, Katsutoshi; Kagei, Kengo; and Bessho, Motoaki, 3,819,705.
Okiyama, Sadao: *See—*
Tokumitsu, Ichiro; Takemura, Toshisada; Sugiyama, Minoru; Nishiyama, Kenji; Ogawa, Shigeo; and Okiyama, Sadao, 3,818,975.
Okuda, Tomoharu: *See—*
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Okui, Ritsuko: *See—*
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Okuma Machinery Works, Ltd.: *See—*
Watanabe, Toshiaki, 3,819,916.
Okumura, Osamu; Sakatani, Takenobu; and Nagayama, Masuzo, to Lion Fat and Oil Company Limited. Process for the continuous preparation of thioether. 3,819,718, Cl. 260-609.00b.
Okumura, Shinji: *See—*
Yoshinaga, Fumihiro; Tsuchida, Takayasu; and Okumura, Shinji, 3,819,483.
Okuno, Yositosi, to Sumitomo Chemical Company, Ltd. Mosquito coil containing a chrysonthemic acid ester. 3,819,823, Cl. 424-40.000.
Okutani, Tetsuya: *See—*
Horii, Satoshi; Mizokami, Nariakira; Fujino, Masahiko; Shinagawa, Susumu; Ochiai, Michihiko; and Okutani, Tetsuya, 3,819,619.
Olathe Manufacturing Company: *See—*
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Oldani, Francesco: *See—*
Crivellaro, Gianbattista; and Oldani, Francesco, 3,819,824.
Olin Corporation: *See—*
Boston, Denis R., 3,819,898.
Horn, Werner G.; and Neumann, Robert M., 3,819,311.
Jordan, Thomas E., 3,819,710.
Oliver, Clifford S. Boat loading apparatus. 3,819,074, Cl. 214-450.000.
Oliverius, Wesley Joseph. Blade for material stripping apparatus. 3,818,593, Cl. 30-169.000.
Olivetti, Ing., C., & C., S.p.A.: *See—*
Pagella, Elio; and Ollearo, Giorgio, 3,818,580.
Pagella, Elio; and Guerci, Carlo, 3,818,643.
Ollearo, Giorgio: *See—*
Pagella, Elio; and Ollearo, Giorgio, 3,818,580.
Olmsted, Leland W.: *See—*
Ballinger, Forrest H.; Heggestad, Robert E.; and Olmsted, Leland W., 3,820,100.
Olson, Orval L.; and Radosavljevic, Dusan, to Nuclear Radiation Development, Inc. Radioactive static electricity eliminator. 3,818,545, Cl. 317-2.00f.
Olympus Co., Ltd.: *See—*
Kawahara, Ichizo, 3,819,267.
Olympus Optical Co., Ltd.: *See—*
Itoh, Keiichi, 3,819,253.
Kinoshita, Kunio; and Itoh, Mitsuto, 3,818,902.
Osanai, Akira, 3,820,148.
Ondetti, Miguel Angel, to Squibb, E. R., & Sons, Inc. Angiotenain converting enzyme inhibitor fractionated snake venom. 3,819,831, Cl. 424-98.000.
Onishi, Akira; Irako, Koichi; Iseda, Yutaka; Hayakawa, Yoshihiro; Kawagoe, Takahiro; and Miyamoto, Shoji, to Bridgestone Tire Company Limited. Method of producing alternating copolymers of conjugated dienes and conjugated polar ethylenically unsaturated moomers. 3,819,590, Cl. 260-80.700.
Ono, Katsuya; Fujiwara, Motozo; Tabe, Norihiko; and Kawahito, Norihiko, to Toray Industries, Inc. Process for producing a thermoplastic shaped article having a double layered wall. 3,819,792, Cl. 264-95.000.
Ono, Yoshizo; and Mizunuma, Tsutomu. Cement expanding agent. 3,819,393, Cl. 106-314.000.
Onoda Cement Co., Ltd.: *See—*
Uchikawa, Hiroshi; and Kasai, Noboru, 3,819,389.
Onuki, Masami: *See—*
Hayashi, Takeshi; and Onuki, Masami, 3,819,990.
Opal, Kenneth E.; Kelly, Charles R.; Newcamp, Charles W.; Ley, William M.; and Pietkiewicz, Robert S., to Power Control Corporation. Method and apparatus for providing efficient and stable power inversion with voltage and frequency control. 3,819,992, Cl. 18-171.000.
Opratko, Vaclav: *See—*
Bell, James Alexander E.; Opratko, Vaclav; and Clarkson, Daniel Kelly, 3,819,801.
Optel Corporation: *See—*
Luce, Nunzio A., 3,820,108.
Orchem Research Company, The: *See—*
McKague, Allan B.; DeWaal, William; and VanWinckel, Carl E. (said McKague and said Waal assors. to said), 3,819,719.
Ormiston, Robert B.: *See—*
Tacke, William H.; Ormiston, Robert B.; and McCrackin, Lonnie L., 3,819,245.
Osanai, Akira, to Olympus Optical Co., Ltd. Motor drive devices for cameras. 3,820,148, Cl. 354-295.000.
Osgood, Edmond R.: *See—*
Bluestone, Henry; and Osgood, Edmond R., 3,819,714.
O'Shea, Francis X., to Uniroyal, Inc. Graft copolymerization of alpha-monoolefin copolymer rubbers to make gum plastics. 3,819,765, Cl. 260-878.00r.
Oshida, Yoshitada: *See—*
Takeda, Yasutsugu; Oshida, Yoshitada; and Imagawa, Fumio, 3,819,248.
Oshima, Masataka: *See—*
Shimauchi, Shiro; Minemura, Norihiro; Matsui, Takesha; Ito, Kenji; Shima, Takeo; and Oshima, Masataka, 3,819,326.
Ostensen, Ralph G.: *See—*
Goldberg, Edward M.; Bazell, Seymour; and Ostensen, Ralph G., 3,818,511.
Osterholm, Tom Eric: *See—*
Andersson, Emil Johan Eilcott; Grondahl, Sven Algot; Rydahl, Nils Anders; and Osterholm, Tom Eric, 3,819,061.
O'Toole, Gerald: *See—*
Weber, Fred A.; Caputo, James P.; Eddy, John W.; Harrington, Phil R.; O'Toole, Gerald; Puccini, Sergio E.; and Adamski, Diane L., 3,819,865.
Ott, Hans, to Sandoz, Inc. Morpholino-substituted-2-aminobenzophenominines. 3,819,625, Cl. 260-247.50r.
Ott, Hans, to Sandoz-Wander, Inc. 1-Substituted-3,4-dihydro-2(1H)-quinazolinones. 3,819,627, Cl. 260-251.0qb.
Otthofer, Jacob A., Jr.: *See—*
Culp, Charles R.; and Otthofer, Jacob A., Jr., 3,818,790.
Otto, Henry E.: *See—*
Howell, William G.; Carpenter, Steve H.; and Otto, Henry E., 3,819,103.
Ottobre, Louis G.: *See—*
Vercellotti, Leonard C.; Britton, James S.; Ottobre, Louis G.; and Cricchi, James R., 3,820,073.
Outboard Marine Corporation: *See—*
Larsen, Robert T., 3,819,000.
Shimancka, William J., 3,818,855.
Overwien, Hermann: *See—*
Pommer, Horst; Mueller, Herbert; and Overwien, Hermann, 3,819,713.
Ovshinsky, Stanford R.: *See—*
Klose, Peter M.; and Ovshinsky, Stanford R., 3,819,377.
Owens, Geoffrey Lloyd: *See—*
Edwards, Reginald Harold; and Owens, Geoffrey Lloyd, 3,818,755.
Owens-Corning Fiberglas Corporation: *See—*
Fargo, Harland E.; and Smucker, Clayton A., 3,819,441.
Pearson, Lee E., 3,818,950.
Thumm, J. Randall; Roberson, Cletis L.; and Klink, Jerome P., 3,819,344.
Owens-Illinois, Inc.: *See—*
Buhs, Marion W.; Cousino, Reynold J.; and DiFrank, Frank J., 3,818,812.
Di Frank, Frank J.; and Greiwe, Daniel L., 3,819,062.
Farrow, Tom Jay; and O'Donnell, Thomas P., 3,818,682.

Pellett, Fred G.; Richards, Raymond S.; Rough, Robert R.; St. John, Douglas F.; and Wengert, Paul R., 3,819,350.
Sanner, Richard Dean, 3,819,972.
Sorbie, Thomas B., 3,819,047.
Weldon, Howard L., 3,819,036.

Oxy Metal Finishing Corporation: *See*—
Murphy, Donald P., 3,819,529.
Russell, William S.; and Reghi, Gary A., 3,819,424.
Schumichen, Helmut; and Muller, Gerhard, 3,819,385.

Oyama, Hiroshi: *See*—
Takahashi, Saburo; Oyama, Hiroshi; Naka, Hiroshi; Yamamoto, Takaji; Nakatomi, Kentaro; Ishibe, Kouichi; and Saito, Toshihiro, 3,819,701.

Oyama, Keiji: *See*—
Oyama, Shozabura; and Oyama, Keiji, 3,818,920.

Oyama, Shozabura; and Oyama, Keiji. Device for preventing umbrella band from dangling. 3,818,920, Cl. 135-36.00f.

Ozaki, Yoshiaki: *See*—
Nakada, Tetsuo; Ozaki, Yoshiaki; and Mishima, Fumiyuki, 3,818,828.

Ozeki, Kazuya; Mochizuki, Haruo; and Sasahara, Hiroaki, to Nippon Electric Company, Limited. Common control switching network for telegraph and telephone exchange. 3,819,868, Cl. 179-18.00c.

Pachter, Irwin J.; Belleau, Bernard R.; and Monkovic, Ivo, to Bristol-Myers Company. 14-Hydroxymorphinan derivatives. 3,819,635, Cl. 260-285.000.

Paetsch, Werner, to Siemens Aktiengesellschaft. Data signal synchronizer. 3,819,858, Cl. 178-69.50r.

Pagella, Elio; and Ollearo, Giorgio, to Olivetti, Ing., C., & C., S.p.A. Machine tool with automatic tool-change. 3,818,580, Cl. 29-568.000.

Pagella, Elio; and Guerci, Carlo, to Olivetti, Ing., C., & C., S.p.A. Grinding machine. 3,818,643, Cl. 51-165.800.

Pain, David Lord: *See*—
Broughton, Barbara Joyce; Large, Bryan John; Marshall, Stuart Malcolm; Pain, David Lord; and Wooldridge, Kenneth Robert Harry, 3,819,631.

Paine, Ellis Howard, to Moldex, Inc. Sonic welding. 3,819,437, Cl. 156-73.000.

Palermo, Blasey Thomas: *See*—
Duvall, Roanld Nash; Gold, Gerald; Hurtle, Richard La Verne; and Palermo, Blasey Thomas, 3,819,269.

Pamer, Karl A., to McNeil Corporation. Collision energy absorber. 3,819,219, Cl. 293-88.000.

Paolucci, Canzio. Device for rotating the cup-holder turret of an automatic dispenser. 3,819,086, Cl. 221-11.000.

Parcell, Robert F. 3-(1-Piperazinylalkyl)-2,4-quinazoline-diones compounds and methods for their production. 3,819,630, Cl. 260-256.50r.

Parent, Ronald A.; and Andrews, John H. P., Jr., to Becton, Dickinson and Company. Testing apparatus. 3,819,505, Cl. 204-299.000.

Parenti, Marcantonio: *See*—
Ambrogi, Vittorio; Logemann, Willy; Parenti, Marcantonio; and Tommasini, Raffaele, 3,819,633.

Parker, Carol. Method and apparatus for blow molding axially deformable containers. 3,819,789, Cl. 264-94.000.

Parker, John A.: *See*—
Riccitiello, Salvatore R.; and Parker, John A., 3,819,550.

Parmenter, Richard L. Bag closure. 3,818,553, Cl. 24-30.50r.

Parsons, Robert A.; and Guidotti, Alfred E., to Troy Mills, Inc. Nonwoven textile products. 3,819,465, Cl. 161-74.000.

Paton, Boris Evgenievich; Theddvar, Boris Izrailevich; Latash, Jury Vadimovich; Chekotilo, Leonty Vasilievich; Emelyanenko, July Georgievich; Us, Vasily Ivandvich; Baglai, Vitaly Mikhailovich; Martyn, Viktor Mikhailovich; Artamonov, Viktor Leonidovich; Bonarenko, Oleg Petrovich; Boiko, Georgy Alexandrovich; Tsikulenko, Anatoly Konstantinovich; Ivon, Vasily Vladimirovich; and Pavlov, Leonid Viktorovich. Electroslag remelting apparatus. 3,818,973, Cl. 164-252.000.

Patrakhaltsev, Nikolai Nikolaevich: *See*—
Leonov, Oleg Borisovich; Arapov, Viktor Viktorovich; Pavljukov, Vladimir Grigorievich; Oblasti, Zhukovsky Moskovskoi; Patrakhaltsev, Nikolai Nikolaevich; Manuilov, Nikolai Nikolaevich; and Soldatov, Nikolai Konstantinovich, 3,818,882.

Patterson, James M., Jr., to Farrington Business Machines Corporation. Portable imprinter including means for providing imprinting pressure compensation. 3,818,829, Cl. 101-269.000.

Patton, Bobbie J.: *See*—
Sexton, James H.; Patton, Bobbie J.; and Harrell, John W., 3,820,063.

Patton, James C.: *See*—
Keith, Billy M.; Bussey, James R.; Cannon, Sidney E.; Patton, James C.; Fisher, Perry G.; Caldwell, Joseph H.; and Crocker, Ralph H., Jr., 3,819,837.

Paulick, David R.; Wark, Emerson L.; and Koeppen, William E., to General Motors Corporation. Two-sectioned room air conditioner construction cabinet. 3,819,244, Cl. 312-101.000.

Paulsen, W. Charles: *See*—
Romanauskas, William A.; and Paulsen, W. Charles, 3,819,111.

Pautrat, Rene: *See*—
Brun, Jean-Pierre; Bulvestre, Gerard; Juillou, Michel; Thirion, Pierre; and Pautrat, Rene, 3,819,742.

Pavelka, Clement C. Tractor with full swivel front section. 3,819,001, Cl. 180-19.00h.

Paviak, Stanley C.: *See*—
Barie, Walter P., Jr.; Franke, Norman W.; and Paviak, Stanley C., 3,819,656.

Paviak, Stanley C., to Gulf Research & Development Company. Sulfonate detergents. 3,819,540, Cl. 252-555.000.

Pavljukov, Vladimir Grigorievich: *See*—
Leonov, Oleg Borisovich; Arapov, Viktor Viktorovich; Pavljukov, Vladimir Grigorievich; Oblasti, Zhukovsky Moskovskoi; Patrakhaltsev, Nikolai Nikolaevich; Manuilov, Nikolai Nikolaevich; and Soldatov, Nikolai Konstantinovich, 3,818,882.

Pavlov, Leonid Viktorovich: *See*—
Paton, Boris Evgenievich; Theddvar, Boris Izrailevich; Latash, Jury Vadimovich; Chekotilo, Leonty Vasilievich; Emelyanenko, July Georgievich; Us, Vasily Ivandvich; Baglai, Vitaly Mikhailovich; Martyn, Viktor Mikhailovich; Artamonov, Viktor Leonidovich; Bonarenko, Oleg Petrovich; Boiko, Georgy Alexandrovich; Tsikulenko, Anatoly Konstantinovich; Ivon, Vasily Vladimirovich; and Pavlov, Leonid Viktorovich, 3,818,973.

Pawlik, James A.: *See*—
Montana, Francis J.; and Pawlik, James A., 3,818,561.

Pearl, David L.; deceased (by Pearl, Peggy P.; sole heir); and Blackshear, David M. Camera capsule. 3,819,856, Cl. 178-7.810.

Pearl, Peggy P.: *See*—
Pearl, David L.; and Blackshear, David M., 3,819,856.

Pears, Gordon Edmund Alfred, to Imperial Chemical Industries, Limited. Method for preparing reclaimable coated polyester films. 3,819,773, Cl. 264-37.000.

Pearson, Lee E., to Owens-Corning Fiberglas Corporation. Rib structure. 3,818,950, Cl. 138-174.000.

Pearson, Ronald Denzil, to Babcock & Wilcox Limited. Pulsating combustors. 3,819,318, Cl. 431-1.000.

Pearson, Ronald Ferguson: *See*—
Lacklison, David Edward; Annis, Alexander David; and Pearson, Ronald Ferguson, 3,819,944.

Peche, Gerhard; and Bettge, Hans, to Siemens Aktiengesellschaft. Vacuum switch with contact material containing a minor percentage of aluminum. 3,819,897, Cl. 200-263.000.

Peczkowski, Joseph L., to Bendix Corporation, The. Fluid flow throttling valve. 3,818,921, Cl. 137-501.000.

Pei, Yu K. Apparatus for forming glass-ceramic articles. 3,819,352, Cl. 65-357.000.

Peippo, Emil. Fish decoy. 3,818,626, Cl. 43-42.040.

Peiser, Alfred M.; and De Pasquale, Matthew J., to Mobil Oil Corporation. Distilling a crude oil. 3,819,511, Cl. 208-353.000.

Pellett, Fred G.; Richards, Raymond S.; Rough, Robert R.; St. John, Douglas F.; and Wengert, Paul R., to Owens-Illinois, Inc. Method for rapidly melting and refining glass. 3,819,350, Cl. 65-134.000.

Pen Pentae-Ondresden Kamera-und Kinowerke: *See*—
Lindner, Fritz, 3,820,132.

Penaloza, Arturo Casterjon; and Datshkovsky, Jose, deceased (by Datshkovsky, Raisa Bardach, legal representative). Film forwarding mechanism. 3,819,098, Cl. 226-85.000.

Penn Corporation: *See*—
Schultz, Hugo C., 3,819,282.

Pennsylvania Engineering Corporation: *See*—
Persson, John A., 3,819,841.

Penwalt Corporation: *See*—
Arpajian, Vasken Frank, 3,819,312.

Pere, Gerard, to Creusot-Loire. Supports for large diameter drums and drive means to rotate the drums. 3,818,777, Cl. 74-410.000.

Perez, Jean Jacques: *See*—
Berthelot, Guy; and Perez, Jean Jacques, 3,819,277.

Perfect Module Systems, Inc.: *See*—
DeSchutter, Camiel R., 3,818,662.
DeSchutter, Camiel R., 3,818,670.

Perkins, Thomas K., to Atlantic Richfield Company. Well drilling, completion and production in permafrost. 3,818,992, Cl. 166-305.000.

Perronnet, Jacques: *See*—
Bertin, Daniel; Perronnet, Jacques; and Teche, Andre, 3,819,722.

Perry, Elijah Robert; and Cronin, John C., to I-T-E Imperial Corporation. Conductive expansion joint for electrical transmission system. 3,819,850, Cl. 174-94.00r.

Persson, John A., to Pennsylvania Engineering Corporation. Iron-free self-baking electrode. 3,819,841, Cl. 13-18.000.

Peruglia, Marco, to Fiat Societa per Azioni. Refrigeration plant suitable for air conditioning systems. 3,818,717, Cl. 62-217.000.

Pesaro, Mario: *See*—
Bozzato, Giuliano; Pesaro, Mario; Schudel, Peter; Hug-Inderbitzin, Marianne; and Erickson, Robert Edward, 3,819,711.

Peter, Eugen; and Herold, Wolfgang, to Licentia Patent-Verwaltungs-G.m.b.H. Tool for cutting cable sheathing. 3,818,590, Cl. 30-90.400.

Peter, Eugen, to Licentia Patent-Verwaltungs-G.m.b.H. Tool for cutting cable sheathing. 3,818,591, Cl. 30-90.400.

Petersen, Philip L. Portable ramp for wheel chairs and the like. 3,818,528, Cl. 14-72.000.

Peterson, Russell D., to TRW Inc. Fixture for holding precisely shaped parts. 3,818,646, Cl. 51-217.00r.

Petit, Jean-Louis, to Productions Epsemes S.A. Trapdoor for smoke eduction. 3,818,816, Cl. 98-43.000.

Petrolite Corporation: *See*—
Fauke, Allen R.; and Buriks, Rudolf S., 3,819,589.
Go, Ting Sin, 3,819,328.

Pettersson, Kent Morgan: *See*—

Carlsson, Eric Ake Ragnar; Dahlsjo, Olof Gustav Robert; Karlsson, Goran Roland; and Pettersson, Kent Morgan, 3,820,116.

**Pfaffle, Ernst, to Sickinger, Hans, Company.** Wire coiling tool. 3,818,954, Cl. 140-92.300.

**Pfender, Emil, to Cordless Car Heater Co.** Catalytic heater and system for preheating internal combustion engines by transmission and infrared radiation. 3,818,884, Cl. 123-142.50r.

**Pfiffner, Albert:** *See—*
Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, 3,819,655.

**Pfister, Jurg R.; Harrison, Ian T.; and Fried, John H., to Syntex Corporation.** Unsaturated ether substituted xanthone carboxylic acid compounds. 3,819,654, Cl. 260-335.000.

**Pfizer Inc.:** *See—*
Hamanaka, Ernest S., 3,819,600.
Rosati, Robert L., 3,819,601.

**Pfleger, Robert K., to Ecodyne Corporation.** Relief-release pumps. 3,819,303, Cl. 417-305.000.

**Pharris, John A.; and Henningsen, Erik.** Paint brushes and handles prepared from integral-skin polurethane foam. 3,819,779, Cl. 264-45.000.

**Philadelphia Quartz Company:** *See—*
Pierce, Richard H.; and Vessey, Eric W., 3,819,526.
Weldes, Helmut H.; Bobb, John S. Stephen; and Derolf, M. Robert, 3,819,392.

**Philco-Ford Corporation:** *See—*
Truskalo, Walter, 3,819,979.

**Philip, Bill Peter.** Adjustable assembly for exhausting out fumes. 3,818,817, Cl. 98-115.0vm.

**Phillips, Donald M., to Westinghouse Electric Corporation.** Method of manufacturing a display screen. 3,819,409, Cl. 117-211.000.

**Phillips, Edward H.; and Phillips, Edwin D.** Pollution-free combustion engine and unique fuel therefor. 3,818,875, Cl. 123-25.00e.

**Phillips, Edward H., to Programmed Power, Inc.** Power converter apparatus and silicon controlled rectifier switching circuit therefor. 3,820,006, Cl. 321-45.00r.

**Phillips, Edwin D.:** *See—*
Phillips, Edward H.; and Phillips, Edwin D., 3,818,875.

**Phillips Petroleum Company:** *See—*
Cleary, James, 3,819,758.
Fahey, Darryl R.; and Kubicek, Donald H., 3,819,738.
Fahey, Darryl R., 3,819,739.
Fozzard, George B., 3,819,493.
Hessert, James E., 3,818,998.
Marsheck, Robert M.; and Poska, Forrest L., 3,819,741.
Oates, Alex N.; and Edmonds, James T., Jr., 3,819,407.

**Phillips, Robert E., to Riker Laboratories, Inc.** Medicament dispenser. 3,818,908, Cl. 128-173.000.

**Photocircuits Division of Kollmorgen Corporation:** *See—*
Schneble, Frederick W., Jr.; Leech, Edward J.; and Polichette, Joseph, 3,819,394.

**Pichel, Michael J., to Swift & Company.** Nutmeat coating compositions for confectionery products. 3,819,839, Cl. 426-93.000.

**Pierce, Alvin S.** Portable pre-fabricated airplane hangar. 3,818,652, Cl. 52-23.000.

**Pierce, John M.:** *See—*
Henrich, Charles T.; and Pierce, John M., 3,820,110.

**Pierce, Richard H.; and Vessey, Eric W., to Philadelphia Quartz Company.** Coated detergent compositions. 3,819,526, Cl. 252-135.000.

**Pietkiewicz, Robert S.:** *See—*
Opal, Kenneth E.; Kelly, Charles R.; Newcamp, Charles W.; Ley, William M.; and Pietkiewicz, Robert S., 3,819,992.

**Pietrelli, Giuseppe; and Pucci, Carlo.** Method and device for pivotally mounting a motor vehicle on a supporting frame. 3,818,579, Cl. 29-559.000.

**Pillar, Walter O.; and Altares, Timothy, Jr., to Arco Polymers, Inc.** Foamed particles for loose fill packaging. 3,819,544, Cl. 260-2.50b.

**Pillar, Walter O.; and Sutton, Robert A., to Arco Polymers, Inc.** Self-extinguishing polymer compositions containing hexabromo-2-butene. 3,819,547, Cl. 260-2.5fp.

**Pillet, Jean, to Rhone-Poulenc S.A.** Implantable joint prosthesis. 3,818,513, Cl. 3-1.000.

**Pine, Buddie J.; and Carter, John R., to Antekna, Inc.** Transmission test set for telephone circuit data communication systems. 3,819,878, Cl. 179-175.30r.

**Pinsky, Jules; Rieger, Carl J.; and Hokanson, Elmer N., to Mearl Corporation, The.** Preparation of nacreous pigmented plastic objects. 3,819,566, Cl. 260-42.140.

**Pioneer Electronic Corporation:** *See—*
Kinoshita, Shouzo, 3,819,876.
Saeki, Yoshifumi; and Takaoka, Saburo, 3,819,957.

**Pirot, Ernst, to Bemberg, J. P., Aktiengesellschaft.** Split fibers from blends of polypropylene and polyethylene. 3,819,769, Cl. 260-897.00a.

**Pisanchyn, John:** *See—*
Koff, Fred W.; and Pisanchyn, John, 3,819,699.

**Pisaroni, Giuseppe.** Polishing machine for finished shoe soles. 3,818,638, Cl. 51-5.000.

**Pitt, Harold M.; and Bender, Harry, to Stauffer Chemical Company.** Production of chlorinated unsaturated hydrocarbons. 3,819,731, Cl. 260-654.00r.

**Pittman, Clarence E.; and Crim, Ivan H., to Lectradate, Inc.** Electronic momentary switch. 3,819,895, Cl. 200-159.00b.

**Plank, David C.:** *See—*
Shaffer, Paul D.; and Plank, David C., 3,819,351.

**Plankl, Leo Hans; Seiler, Claus-Dietrich; and Vahlensieck, Hans-Joachim, to Dynamit Nobel AG.** Surface protection of porous materials. 3,819,400, Cl. 117-54.000.

**Plante, Floyd A., to Dow Corning Corporation.** Coatings giving controlled release. 3,819,745, Cl. 260-825.000.

**Plasser, Franz; and Theurer, Josef.** Mobile ballast treating apparatus. 3,818,619, Cl. 37-104.000.

**Plastic Tubing, Inc.:** *See—*
Maroschak, Ernest J., 3,819,778.

**Plastronics Corporation:** *See—*
Bird, Stanford W., 3,819,080.

**Platt, Walter A., to Bendix Corporation, The.** Closed loop control system including an integrator and limiting means therefor. 3,819,999, Cl. 318-609.000.

**Playart Limited:** *See—*
Tong, Duncan, 3,818,632.

**Plessey Handel und Investments A.G.:** *See—*
Goodinge, Mark Wallinger; and Shephard, Robert, 3,819,116.

**Plisky, John J., to Anderson Company, The.** Windshield wiper assembly. 3,818,536, Cl. 15-250.420.

**Ploeger, Walter, Jr.; and Bishop, John W. H., to Controlled Printout Devices, Inc., mesne.** Printing ribbon spool. 3,819,026, Cl. 197-171.000.

**Ploppa, Jurgen:** *See—*
Bauknecht, Gunter; Hadam, Wilhelm; and Ploppa, Jurgen, 3,820,082.

**Plueddemann, Edwin P., to Dow Corning Corporation.** Cationic unsaturated amine-functional silane coupling agents. 3,819,675, Cl. 260-448.80r.

**Pocock, Frederick J.; and Leedy, William G., to Babcock & Wilcox Company, The.** Industrial technique. 3,819,476, Cl. 176-37.000.

**Pohland, Albert:** *See—*
Thompson, Wayne E.; and Pohland, Albert, 3,819,689.

**Poje, Albert J.; and Newallis, Peter E., to Chemagro Corporation.** Retarding plant growth with cycloxexenone oximes. 3,819,358, Cl. 71-121.000.

**Polaroid Corporation:** *See—*
Baker, Philip G.; Cook, Gerald H.; and Downey, Rogers B., 3,820,149.
Barstow, Frederick C.; and Uhrich, Carole J., 3,819,381.
Bjork, Albion P., 3,819,983.
Burgarella, John P.; Carcia, Peter P.; and Kee, Richard C., 3,820,128.
Driscoll, John J., 3,820,137.
Hoffman, Arnold, 3,819,375.
Kennedy, C. Bruce, 3,820,136.
Land, Edwin H., 3,819,376.
Sahatjian, Ronald A.; and Taylor, Lloyd D., 3,819,371.

**Polata, Bohumil, to Signetics Corporation.** Method for fabricating semiconductor structure having complementary devices. 3,818,583, Cl. 29-578.000.

**Polichette, Joseph:** *See—*
Schneble, Frederick W., Jr.; Leech, Edward J.; and Polichette, Joseph, 3,819,394.

**Pollak, Kurt; and Boshold, Raymond F., to Wean United, Inc.** Method and apparatus for loading workpieces in a press. 3,818,745, Cl. 72-270.000.

**Pollak, Peter I.:** *See—*
Christensen, Burton G.; Pollak, Peter I.; and Wendler, Norman L., 3,819,676.

**Pollmann, Fritz; and Wiessner, Edgar, to Siemens Aktiengesellschaft.** Device for mounting electrical equipment including a snap fastening conductor mounting plate. 3,819,988, Cl. 317-99.000.

**Pollock, Howard D.** Retractable directional lights for truck trailer vehicles. 3,819,927, Cl. 240-8.220.

**Pollution Control Products, Inc.:** *See—*
Mattson, Gerald H., 3,819,808.

**Pommer, Horst; Mueller, Herbert; and Overwien, Hermann, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft.** Production of alkenones. 3,819,713, Cl. 260-593.00r.

**Ponnet, Robert; and Thomson-CSF, to Method of manufacturing integrated magnetic memories.** . 3,819,341, Cl. 29-604.000.

**Poolman, Petrus Jacobus:** *See—*
van Esdonk, Johannes; and Poolman, Petrus Jacobus, 3,819,500.

**Popdan Gary L.:** *See—*
Muller, Thomas P.; and Popdan Gary L., 3,819,018.

**Pope, Bill J., to Megadiamond Corporation.** Plural molded diamond articles and their manufacture from diamond powers under high temperature and pressure. 3,819,814, Cl. 423-446.000.

**Porosan Interests, U.S.A., Inc.:** *See—*
Engel, Walter H., 3,819,405.

**Port, Darrell P.:** *See—*
Egan, Dale W.; Holstrom, Geoffrey B.; Lord, Harry C.; Stevens, Robert W.; Port, Darrell P.; and Howard, Rollen D., 3,819,945.

**Portage Newspaper Supply Company:** *See—*
Hosterman, Harry L., 3,820,122.

**Porter, John P.:** *See—*
Karper, Paul W.; and Porter, John P., 3,818,751.

**Ports, David W.:** *See—*
Argyle, John F.; Medowski, Glenn O.; Ports, David W.; and Sutch, Richard D., 3,819,785.

**Poschmann, Franz:** *See—*

Schreiner, Siegfried; Lukas, Siegmar, and Poschmann, Franz, 3,819,807.
Poska, Forrest L.: *See—*
Marsheck, Robert M.; and Poska, Forrest L., 3,819,741.
Posselt, Klaus: *See—*
Von Bebenburg, Walter; and Posselt, Klaus, 3,819,617.
Possis Corporation: *See—*
Del Bono, Mario, 3,818,570.
Post Office, The: *See—*
Ball, John Robin, 3,820,034.
Postlethwaite, Alan W.: *See—*
Vartanian, Haig; Postlethwaite, Alan W.; and Mao, Robert Y. L., 3,818,581.
Potter Instrument Company, Inc.: *See—*
Murray, Joseph John, 3,819,348.
Powell, Mabrin P.; and Nauman, Mark R., to Champion International Corporation. Process for productions of pressure-sensitive copy sheet. 3,819,398, Cl. 117-36.700.
Power Control Corporation: *See—*
Opal, Kenneth E.; Kelly, Charles R.; Newcamp, Charles W.; Ley, William M.; and Pietkiewicz, Robert S., 3,819,992.
Power Electronics International, Inc.: *See—*
Habisohn, Victor J., 3,819,996.
Pozzi, Arthur A., to Bend Millwork Company. Manufacture of door jamb and door stop simultaneously from same wood member. 3,818,960, Cl. 144-326.00r.
PPG Industries, Inc.: *See—*
Shaffer, Paul D.; and Plank, David C., 3,819,351.
Praznovsky, Istvan; and Gyulavari, Imre, to Nikex Nehezipari Kulkereskedelmi Vallalat. Purification of effluent containing organic matter. 3,819,512, Cl. 210-8.000.
Precision Parts Company, Inc.: *See—*
Bittner, Charles W.; and Rexon, George F., 3,818,945.
Preece, Kenneth, to Lucas, Joseph, (Electrical) Limited. Method of manufacturing yoke assemblies. 3,818,585, Cl. 29-596.000.
Prenzel, Karl; and Barthel, Hans, to Ardie-Werk GmbH. Gear changing means for change-speed gearboxes. 3,818,776, Cl. 74-364.000.
Presley, Rex W.: *See—*
Foxworthy, Eugene R.; Blatter, Albert; Gamber, William N.; Presley, Rex W.; and Verge, Kenneth W., 3,819,135.
Presuss, Friedrich; and Simeth, Claus, to Roland Offsetmaschinenfabrik Faber & Schleicher AG. Cleaning apparatus for a sheet delivery mechanism. 3,819,032, Cl. 198-180.000.
Price, Harry C., to Xerox Corporation. Copier jam protection. 3,819,266, Cl. 355-64.000.
Priestly, Frank; Coverley, Jack; and Shulda, Raymond E., to Lockheed Aircraft Corporation. Braking device. 3,819,127, Cl. 242-156.200.
Prilutsky, Yakov Khaimovich: *See—*
Baturov, Vladimir Ivanovich; Prilutsky, Yakov Khaimovich; Shiborin, Viktor Ivanovich; and Shkoropad, Dmitry Evseevich, 3,819,110.
Principe, Pacifico A.: *See—*
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Prindle, Hershel Beebe: *See—*
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Pritchard, Dalton H.; and Schroeder, Alfred C., to Radio Corporation of America. Color television. 3,820,157, Cl. 358-30.000.
Pritchard, Edward. Feed and injection water control for steam generators. 3,818,699, Cl. 60-665.000.
Pritchet, Walter C.: *See—*
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Procter & Gamble Company, The: *See—*
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McCoy, Bobby Ray, 3,819,828.
Productions Epsemes S.A.: *See—*
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Products International Incorporated: *See—*
Blum, Alvin S., 3,820,072.
Programmed Power, Inc.: *See—*
Phillips, Edward H., 3,820,006.
Pruski, Edward M.: *See—*
Brouillette, Joseph W.; and Pruski, Edward M., 3,820,043.
Przedsiebiorstwo Doswiadczalne Pros Aulomahycznychi Tlocznikow Pornar-Hydomct: *See—*
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Pucci, Carlo: *See—*
Pietrelli, Giuseppe; and Pucci, Carlo, 3,818,579.
Puccini, Sergio E.: *See—*
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Puckette, Charles McD.; and Butler, Walter J., to General Electric Company. Differential bucket-brigade circuit. 3,819,953, Cl. 307-221.00d.
Puckette, Charles McD., to General Electric Company. Adaptive threshold circuit employing nand gates interconnecting flip-flop circuit. 3,820,051, Cl. 328-71.000.
Puklics, Maria; Guczoghy, Lajos; Matolcsy, Gyorgy; and Bodnar, Janos, to Chinoin Gyogyszer-es Vegyeszeti Termekek Gyara Rt. Fungicidal 2-alkoxy-5-halogeno-benzene diazonium cyanides. 3,819,609, Cl. 260-141.000.
Pulaski, Albert, to K. C. Pen Co., Inc., mesne. Writing instrument with projecting and retracting mechanism. 3,819,283, Cl. 401-106.000.
Pullman Incorporated: *See—*
Lee, Sang H., 3,818,843.
Puma-Sportschuhfabriken Rudolf Dassler KG: *See—*
Dassler, Rudolf; Dreier, Horst; Strickle, Erich; and Muller, Norbert, 3,818,617.
Puster, Louis M., to Robertshaw Controls Company. Fluid control device and method of making the same. 3,818,923, Cl. 137-85.000.
Puster, Louis M.; Lewis, Jay L.; and Brakebill, Harold G., to Robertshaw Controls Company. Fluid control system and method of operating the same. 3,819,113, Cl. 236-82.000.
Pyper, Alan Smith. Glass breaking. 3,819,096, Cl. 225-96.500.
Quantor Corporation: *See—*
Ammann, Stephen K., 3,820,123.
Questor Corporation: *See—*
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Quinn, Frederic R., to Zyrotron Industries, Inc. Plurality of semiconductor elements mounted on a common base. 3,820,153, Cl. 357-81.000.
Quint, Robert John: *See—*
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Rabold, Jurgen: *See—*
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Radcliffe, Stanley L.; and Dornan, Arthur E., to Massey-Ferguson Inc. Vehicle braking system. 3,819,016, Cl. 188-82.600.
Rader, Charles Phillip: *See—*
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Radici, Pierino: *See—*
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Radio Corporation of America: *See—*
Pritchard, Dalton H.; and Schroeder, Alfred C., 3,820,157.
Radke, Donald G.; and Stephenson, Robert L., to Allied Chemical Corporation. Inflation apparatus for safety device. 3,819,203, Cl. 280-150.0ab.
Radosavljevic, Dusan: *See—*
Olson, Orval L.; and Radosavljevic, Dusan, 3,818,545.
Rahlff, Manfred, to U.S. Philips Corporation. Digital light deflector. 3,819,939, Cl. 250-225.000.
Raikovsky, Jury Borisovich: *See—*
Andoniev, Sergei Mikhailovich; Zilberman, Leonid Borisovich; Kudinov, Gennady Alexandrovich; Kutsykovich, Dorina Borisovna; Lukashev, Vladimir Afanasievich; Raikovsky, Jury Borisovich; and Filipiev, Oleg Vladimirovich, 3,818,870.
Ramsden, Hugh E., to Rhodia, Inc. Process for the preparation of nonconjugated dienix grignard reagents and their utilization in organic syntheses. 3,819,733, Cl. 260-665.00g.
Rankin, David: *See—*
Galiano, Francis R.; Kellum, Gene E.; King, Terry R.; and Rankin, David, 3,819,598.
Rasmussen, Carl M.: *See—*
Rasmussen, Reed; and Rasmussen, Carl M., 3,819,077.
Rasmussen, Reed; and Rasmussen, Carl M. Camper loading and securing system. 3,819,077, Cl. 214-516.000.
Rathbun, William H., to General Electric Company. Fail safe vacuum type circuit interrupter and associated load current tap changer for electric induction apparatus. 3,819,892, Cl. 200-144.00b.
Ratledge, Edward; and Ware, Richard E., to Sun Oil Company. Stabilized wax emulsions. 3,819,530, Cl. 252-311.500.
Rauland-Borg Corporation: *See—*
Singhi, Dilip T.; and Medal, Richard J., 3,819,870.
Rautiola, Norman A.: *See—*
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Ravenscroft, Edward: *See—*
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Raymond, Guy, Engineering Company Limited: *See—*
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Raymond, Jan Wayne; and Whetstone, Clay N., to Cyromagnetics Corporation. Method of casting and working a billet having a plurality of openings therein. 3,818,578, Cl. 29-527.500.
RCA Corporation: *See—*
Beck, Francis Xavier, Jr.; and Kinslow, William Edward, Jr., 3,819,012.
Greenaway, David Leslie, 3,819,911.
Neal, David Lynn, 3,820,155.
Read, Norman Weldon, to Dresser Industries, Inc. Well packer. 3,818,988, Cl. 166-140.000.
Reasnor, Larry J.: *See—*
Cobb, Earnest G.; and Reasnor, Larry J., 3,819,223.
Rebentisch, Hans Waldemar, to USM Corporation. Electrically heated continuous band applicator. 3,818,860, Cl. 118-202.000.
Redmann, Ulrich: *See—*
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Von Szczepanski, Christoph; Heindl, Joseph; Schroder, Eberhard; Kessler, Hans-Joachim; and Redmann, Ulrich, 3,819,717.
Reed, David Austin: *See—*
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Reel Vortex, Inc.: *See—*

Ferguson, Hugh S., 3,818,684.

Reese, Richard G., to Combustion Power Co., Inc. Method and apparatus for liquid disposal in a fluid bed reactor. 3,818,846, Cl. 110-8.00r.

Reeves, Richard F.: *See—*
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Reeves, Wilson A.: *See—*
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Reflex Corporation of Canada Limited: *See—*
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Reghi, Gary A.: *See—*
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Regie Nationale des Usines Renault: *See—*
Bouthors, Pierre; Dera, Alain; and Lefeuvre, Andre, 3,819,196.

Rehder, Max C. Seed abrading device. 3,818,822, Cl. 99-600.000.

Rehkopf Industries, Inc.: *See—*
Rehkopf, John W.; and Barteck, Werner W., 3,819,138.

Rehkopf, John W.; and Barteck, Werner W., to Rehkopf Industries, Inc. Chock cradle. 3,819,138, Cl. 248-146.000.

Reichenbach, William. Electrical probe tester for continuity testing cartridge fuses in a fuse block. 3,820,017, Cl. 324-51.000.

Reichhold Chemicals, Inc.: *See—*
Kubitz, Karl Alfred; and Wicke, Alfred Frederick, 3,819,737.

Reichhold-Albert-Chemie Aktiengesellschaft: *See—*
Dalibor, Horst; Gutte, Richard; and Stenzel, Gunter, 3,819,447.

Reid, Philip L.; and Holcombe, Edward L., to Grace, W. R., & Co. Closing system for bags and the like. 3,818,574, Cl. 29-243.570.

Reighard, Allan B.: *See—*
Crum, Gerald W.; Reighard, Allan B.; and Tamny, Simon Z., 3,818,930.

Reimbold, James J., Jr., to Chance, A. B., Company. Convertible sheave assembly for telescoping derricks. 3,819,063, Cl. 214-3.000.

Reis, Anton, to Lienhard AG. Device for the arrangement and mounting of tools. 3,819,058, Cl. 211-60.00t.

Removable insulated pipe jacket: *See—*
Johnson, Lowell, 3,818,949.

Research Corporation: *See—*
Mann, Elton W., 3,819,829.

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Retzloff, Russell C.: *See—*
Callies, Gerald A.; Irland, Frank W.; Retzloff, Russell C.; and Zellers, James T., 3,819,347.

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Rexnard Inc.: *See—*
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Rexon, George F.: *See—*
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Rhines, Walden C.: *See—*
Stevenson, David A.; Rhines, Walden C.; and Maruska, Herbert P., 3,819,974.

Rhoades, Lawrence J., to Extrude Hone Corporation. Medium for process for honing by extruding. 3,819,343, Cl. 51-302.000.

Rhodenizer, Harold L.: *See—*
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Rhodia, Inc.: *See—*
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Rhone-Poulenc S.A.: *See—*
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Sagi, Ferenc; and Roussos, Michel, 3,819,673.

Riccitiello, Salvatore R.; and Parker, John A., to United States of America, National Aeronautics and Space Administration. Intumescent composition, foamed product prepared therewith and process for making same. 3,819,550, Cl. 260-2.5fp.

Rich, Leonard G.; and Gerber, Heinz Joseph, to Gerber Scientific Instrument Company, The. Apparatus for expressing a writing fluid. 3,820,121, Cl. 346-140.000.

Richards, Carl H., Jr., to Richards' Quality Bedding Company. Mattress cover construction. 3,818,520, Cl. 5-345.000.

Richards, Carl H., Jr., to Richard's Quality Bedding Company. Mattress cover construction. 3,818,521, Cl. 5-345.00r.

Richards, Colin Temple, to BP Chemicals Limited. Polymerization of vinyl aromatic monomers in aqueous suspension. 3,819,597, Cl. 260-93.50w.

Richards' Quality Bedding Company: *See—*
Richards, Carl H., Jr., 3,818,520.
Richards, Carl H., Jr., 3,818,521.

Richards, Raymond S.: *See—*
Pellett, Fred G.; Richards, Raymond S.; Rough, Robert R.; St. John, Douglas F.; and Wengert, Paul R., 3,819,350.

Richardson, Rolf Price, to Maverick Industries, Incorporated. Burglar bar for outswing door. 3,819,216, Cl. 292-259.000.

Richter, Herbert P.; and Tedrick, Ruth E., to United States of America, Navy. Chemiluminescent device. 3,819,925, Cl. 240-2.250.

Rick, Edward A.: *See—*
Argento, Benny J.; and Rick, Edward A., 3,819,735.

Ricoh Co., Ltd.: *See—*
Abe, Takeshi, 3,819,908.

Riebel, Hans-Jochem; Brokmeier, Dieter; and Hammann, Ingeborg, to Bayer Aktiengesellschaft. O-Vinyl-thionophosphoric(-phosphonic) acid esters. 3,819,753, Cl. 260-942.000.

Rieger, Carl J.: *See—*
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Rigassi, Norbert: *See—*
Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, 3,819,655.

Riker Laboratories, Inc.: *See—*
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Rines, Robert H.: *See—*
Lorina, John; Aluisy, G. Ronald; Loud, Norman D.; and Rines, Robert H., 3,819,820.

Ringspann Albrecht Maurer KG: *See—*
Timtner, Karlheinz, 3,819,019.

Rists Wires & Cables Limited: *See—*
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Ritter, Norman C.: *See—*
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Rittig, Falk: *See—*
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Cole, George S.; Ritzenthaler, Richard L.; and Arnold, Don C., 3,819,148.

Rlotkin, Victor, to Spiegel Industries Corporation. Blace for rigidifying joints between elongated structural members. 3,819,290, Cl. 403-388.000.

Roberson, Cletis L.: *See—*
Thumm, J. Randall; Roberson, Cletis L.; and Klink, Jerome P., 3,819,344.

Roberts, John D.; Ellenberg, John D.; and Keith, Charles H., to Celanese Corporation. Process for making cigarette filters from short synthetic fibers. 3,819,435, Cl. 156-62.200.

Robertshaw Controls Company: *See—*
Berleyoung, Walter J.; and Lewis, Jay L., 3,818,763.
Caldwell, Edward N., 3,818,981.
Goodhouse, Carl J., 3,819,112.
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Robins, A. H., Company, Incorporated: *See—*
Welstead, William John, Jr.; and Merriman, Burt Trosey, Jr., 3,819,641.

Robinson, James R., to Standard Forge and Axle Company, Incorporated. Brake camshaft support assembly. 3,819,242, Cl. 306-36.100.

Robinson, Murray Clinton, to Spring Chemicals Limited. Process for treating waste sulfite liquor. 3,819,802, Cl. 423-158.000.

Robinson, William; Davis, John Brian; and Skilling, Derek, to Imperial Chemical Industries, Limited. Process and apparatus for the production of tubes and tubular films. 3,819,776, Cl. 264-40.000.

Roche, William J., to GTE Sylvania Incorporated. Low pressure ultraviolet lamp. 3,819,970, Cl. 313-225.000.

Rockwell International Corporation: *See—*
Hillberg, Ernest T.; and Isenberg, Lionel, 3,818,664.
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Rogers, Chester D., to Olathe Manufacturing Company. Wood and brush chipper. 3,819,121, Cl. 241-240.000.

Rogers, Rudy E.; and Murphy, James L., Jr., to Thiokol Chemical Corporation. Method of making ultra-fine ammonium perchlorate particles. 3,819,336, Cl. 23-302.000.

Rogers, W. Clark, Jr.; and Snitzer, Morton, to Lane Company, Inc., The. Rocker recliner chair. 3,819,229, Cl. 297-84.000.

Rogers, William M., Jr., to Johns-Manville Corporation. Block-type wall assembly and method of constructing the same. 3,818,665, Cl. 52-375.000.

Rohm & Haas Company: *See—*
McNulty, Patrick J.; Swithenbank, Colin; Viste, Kenneth L.; and Von Meyer, William C., 3,819,355.

Rohowetz, Stanley Edward, to American Can Company. Lap side seam of metal, tubular body and method for making same. 3,819,085, Cl. 220-75.000.

Roland Offsetmaschinenfabrik Faber & Schleicher AG.: *See—*
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Rollins, Forrest Theodore; Kubovich, Frank Steve; Buess, Kenneth Benning; and Hartzell, Donald Joseph, to Naremco, Inc. Method and apparatus for packaging compressible materials. 3,818,673, Cl. 53-24.000.

Romanauskas, William A.; and Paulsen, W. Charles, to Sorvall, Ivan, Inc. Centrifuge rotor cover. 3,819,111, Cl. 233-27.000.

Romann, Dale F. Frost-free protective face and head enclosure. 3,818,510, Cl. 2-9.000.

Rome Industries: *See—*
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Romel Distributors, Inc.: *See—*

Hogue, Earl F.; and Katch, Richard P., 3,818,621.
Romo, Leon E.; and Andrish, Jack T. Apparatus for preventing neck injury. 3,818,509, Cl. 2-3.00r.
Roodnat, Ben J.: *See—*
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Rosati, Robert L., to Pfizer Inc. Alpha-carboxy-2-thienylmethyl penicillin and cephalosporin and esters and salts thereof. 3,819,601, Cl. 260-239.100.
Rose, Henry J., to Tee-Pak, Inc. Easily peelable sausage casing. 3,818,947, Cl. 138-118.100.
Rosenbaum, Georges: *See—*
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Rosenthal, Rudolph, to Atlantic Richfield Company. Oxidation of metal sulfide ores with organic hydroperoxides. 3,819,798, Cl. 423-41.000.
Rosenvold, Loe. Truck box cover device. 3,819,082, Cl. 220-24.00r.
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Roskott, Lodewijj; and Groenendaal, Arnoldus Adrianus Maria, to Akzo N.V. Stabilizer systems for light-curable polyesters. 3,819,496, Cl. 204-159.190.
Roskott, Lodewijk; and Groenendaal, Arnoldus Adrianus Maria, to Akzo N.V. Stabilizer systems for light-curable polyesters. 3,819,495, Cl. 204-159.190.
Roth, Albert. High speed analog-to-digital conversion system. 3,820,112, Cl. 340-347.0ad.
Roth, Barbara; and Strelitz, Justina, to Burroughs Wellcome & Co., (U.S.A.) Inc. Method for preparing 2,4-diamino-5-(3,4,5-trimethoxy-benzyl)pyrimidine. 3,819,629, Cl. 260-256.40n.
Rottner, Gunter: *See—*
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Rough, Robert R.: *See—*
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Round, Lowell D. Guitar tuner. 3,818,793, Cl. 84-454.000.
Roussel-UCLAF: *See—*
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Roussos, Michel: *See—*
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Rudolph, Hans; Dhein, Rolf; De Cleur, Eckhard; and Kreuder, Hans-Joachim, to Bayer Aktiengesellschaft. Coating material based on blocked polyurethanes. 3,819,586, Cl. 260-77.5tb.
Rudolph, Karl-Heinz; Buchner, Werner; and Noll, Walter, to Bayer Aktiengesellschaft. Process for the production of acetoxysilylethyl-substituted organopolysiloxanes. 3,819,674, Cl. 260-448.20r.
Ruetman, Sven H., to Dow Chemical Company, The. Process for producing chlorinated 2,2'- or 4,4'-bipyridines. 3,819,558, Cl. 260-296.00d.
Ruhland, Alois: *See—*
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Runte, Herbert, to Harre, Aug., & Co. Mailer for biological samples. 3,819,081, Cl. 220-17.000.
Rusbach, Maurice, to Sarmac S.A. Self propelled projectile with fins. 3,819,132, Cl. 244-3.280.
Rush, Michael M.; Subers, John E., Jr.; and Herring, Peter C., to Expert Precision Electronic Research. Video camera and receiver system for producing enlarged images of work. 3,819,855, Cl. 178-7.810.
Rush, Robert L.; Leon, Luis P.; and De Lea, Anne C., to Technicon Instruments Corporation. Diagnostic compositions for glutamic oxalic transaminase (GOT) and glutamic pyruvic transaminase (GPT) determinations. 3,819,488, Cl. 195-103.50r.
Russell, Frederick; and Dumbill, Cyril G., to Brown & Williamson Tobacco Corporation. Packaging machines. 3,818,676, Cl. 53-173.000.
Russell, John J., Jr.: *See—*
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Russell, Philip W.; Simons, Charles W.; and Chupka, Francis L., Jr., to Grace, W. R., & Co. Sheet metal laminate bonded with ethylene copolymer-polyamide adhesive. 3,819,473, Cl. 161-214.000.
Russell, William J., to Robertshaw Controls Company. Valve means for a fluid pump or the like and method of making same. 3,819,306, Cl. 417-466.000.
Russell, William S.; and Reghi, Gary A., to Oxy Metal Finishing Corporation. Method and composition for treating metal surfaces. 3,819,424, Cl. 148-6.15r.
Ruyle, William V.: *See—*
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Rylewski, Fugeniusz Michael. Gas turbine. 3,818,695, Cl. 60-39.16c.
S.A. Texaco Belgium N.V.: *See—*
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Saab-Scania Aktiebolag: *See—*
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SABA Schwarzwalder Apparate-Bau-Anstalt: *See—*
Maier, Gerhard, 3,820,027.
Sabelus, Guenther: *See—*
Beck, Fritz; Sabelus, Guenther; Fischer, Roman; and Haufe, Juergen, 3,819,548.
Sabins, Rolland C., to Saratoga Development Corporation. Aerator head. 3,819,160, Cl. 261-123.000.
Sable, Arthur J., to Sable Photo Works, Inc. Apparatus for determining exposure parameters for making prints from color transparencies. 3,819,373, Cl. 96-23.000.
Sable, Donald E. Device for and a method of watering and feeding plants. 3,818,633, Cl. 47-1.200.
Sable Photo Works, Inc.: *See—*
Sable, Arthur J., 3,819,373.
Sadler, Thomas H.: *See—*
Daniel, Leonard Irving; Sadler, Thomas H.; Nawn, John F.; and French, David Walter, 3,819,210.
Saeki, Yoshifumi; and Takaoka, Saburo, to Pioneer Electronic Corporation. Two channel balance control device. 3,819,957, Cl. 307-264.000.
Saerbeck, Baier: *See—*
Schmitz, Rudolf; and Saerbeck, Baier, 3,818,970.
Saeva, Franklin D.; and Schank, Richard L., to Xerox Corporation. Liquid crystal compositions. 3,819,531, Cl. 252-408.000.
Safer Marketing Aktiebolag: *See—*
Svensson, Lars Erik; and Julin, Gustav, 3,819,022.
Saffadi, Richard R., to Stevens, J. P., & Co., Inc. Unidirectional, high modulus knitted fabrics. 3,819,461, Cl. 161-58.000.
Sage, Burton H.: *See—*
Carter, Charles N.; and Sage, Burton H., 3,819,913.
Sagi, Ferenc; and Roussos, Michel, to Rhone-Poulenc S.A. Process for the polycondensation of organosilicon compounds in the presence of tin catalyst. 3,819,673, Cl. 260-448.20e.
Sahatjian, Ronald A.; and Taylor, Lloyd D., to Polaroid Corporation. Novel products and processes. 3,819,371, Cl. 96-3.000.
Saiki, Noritsugu: *See—*
Aito, Yuzo; Fujii, Takeshi; Saiki, Noritsugu; Shuji, Irie; and Yasujuni, Nakatsuji, 3,819,760.
Saint-Gobain: *See—*
Battigelli, Jean, 3,819,345.
Saint-Gobain Industries: *See—*
Vermeerbergen, Leon, 3,819,777.
S.A.I.P. (S.p.A.): *See—*
Bianchi, Turreno, 3,819,286.
Saito, Takanori: *See—*
Akane, Junta; Saito, Takanori; and Yasuda, Tetsuo, 3,819,763.
Saito, Toshihiro: *See—*
Takahashi, Saburo; Oyama, Hiroshi; Naka, Hiroshi; Yamamoto, Takaji; Nakatomi, Kentaro; Ishibe, Kouichi; and Saito, Toshihiro, 3,819,701.
Sakakibara, Shunsaku: *See—*
Shimizu, Hiroshi; Sakakibara, Shunsaku; and Ishigura, Ryoichi, 3,819,349.
Sakatani, Takenobu: *See—*
Okumura, Osamu; Sakatani, Takenobu; and Nagayama, Masuzo, 3,819,718.
Sakazaki, Tadazumi: *See—*
Nomura, Katsuhiko; Uno, Naoyuki; Sakazaki, Tadazumi; Watanabe, Koichiro; and Urano, Fumio, 3,820,139.
Sakota, Koichiro: *See—*
Yamashita, Gentaro; Fujii, Takeshi; and Sakota, Koichiro, 3,819,695.
Sakshaug, Eugene C., to General Electric Company. Sparkover stabilizing means for an ungraded surge voltage arrester. 3,819,987, Cl. 317-70.000.
Sakuragawa, Yoshio; and Honma, Kiyoshi, to Toray Industries, Inc. Method and apparatus for producing warp and weft inter-knitted fabrics. 3,818,725, Cl. 66-62.000.
Salemme, Robert M.: *See—*
Ward, William J.; Salemme, Robert M.; and Mayer, Jerome F., 3,819,806.
Sallay, Stephen I., to American Home Products Corporation. 7,12 Di(lower)alkyl-homobenzmorphans. 3,819,614, Cl. 260-239.0bb.
Salmre, William: *See—*
McCarthy, Jeremiah P.; and Salmre, William, 3,819,867.
Salonia, Thomas R.: *See—*
Hart, Le Roy; Salonia, Thomas R.; and Bergen, Gary R., 3,819,214.
Salunen, Eero: *See—*
Toivonen, Matti; Kettunen, Kyrki; and Salunen, Eero, 3,819,812.
Sanctuary, Clifford; Woods, Donald C.; and Bachman, John A., to Del Mar Engineering Laboratories. Apparatus for automatically periodically measuring and displaying the total air expired by a subject during each of a succession of given time intervals. 3,81,901, Cl. 128-2.080.
Sand Arts Incorporated: *See—*
Allen, Philo H., 3,819,436.

**Sanders Associates, Inc.:** *See—*
Stillman, Stephen L., Jr., 3,818,523.
**Sandoz, Inc.:** *See—*
Ott, Hans, 3,819,625.
**Sandoz Ltd.; a/k/a Sandoz AG:** *See—*
Hofer, Kurt; and Tscheulin, Guenther, 3,819,650.
**Sandoz-Wander, Inc.:** *See—*
Galantay, Eugene E., 3,819,694.
Manning, Robert E., 3,819,708.
Ott, Hans, 3,819,627.
Simpson, William R., 3,819,628.
**Sanner, Richard Dean,** to Owens-Illinois, Inc. Glass compositions and cathode-ray tubes made therefrom. 3,819,972, Cl. 313-480.000.
**Sanno, Haruyoshi:** *See—*
Shimomura, Takatoshi; Nagata, Hideo; Murakami, Yoshiaki; Sanno, Haruyoshi; and Inoue, Tadanori, 3,819,767.
**Santaella, F. Gregory,** to Goodway, Inc. Method and apparatus for forming a plurality of booklets. 3,819,172, Cl. 270-41.000.
**Santaeulalia, Antonio Casacuberta:** *See—*
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**Santi, John D.:** *See—*
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**Saratoga Development Corporation:** *See—*
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**Saratoga Systems, Inc.:** *See—*
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**Sarmac S.A.:** *See—*
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**Sasahara, Hiroaki:** *See—*
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**Sasse, Klaus:** *See—*
Tarnow, Horst; Sasse, Klaus; Homeyer, Bernhard; and Wolfgang, Behrenz, 3,819,755.
**Sato, Eiichi:** *See—*
Nagai, Hidetaka; Sato, Eiichi; and Kobayashi, Fujio, 3,819,822.
**Sato, Kurayoshi:** *See—*
Sugano, Hiroshi; Tsushima, Ken; Sato, Kurayoshi; and Araikawa, Noboru, 3,819,296.
**Sato, Seiji:** *See—*
Nara, Takashi; Takasawa, Seigo; Okachi, Ryo; Kawamoto, Isao; Kumakawa, Masaru; Yamamoto, Mitsuyoshi; and Sato, Seiji, 3,819,485.
**Sato, Tamio:** *See—*
Takago, Toshio; Sato, Tamio; and Aoki, Hisashi, 3,819,563.
**Sato, Yuji;** and Takahashi, Hideyuki. Process for conversion of alkyl aromatic hydrocarbons. 3,819,736, Cl. 260-672.00t.
**Satoi, Shuzo:** *See—*
Murao, Sawao; Satoi, Shuzo; Kuwana, Noriaki; Fukumura, Masayuki; and Kawamura, Tamio, 3,819,486.
**Satter, Abdus:** *See—*
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**Sauder Industries, Inc.:** *See—*
Sauder, Robert A.; Kendrick, Gary R.; and Mase, John R., 3,819,468.
**Sauder, Robert A.;** Kendrick, Gary R.; and Mase, John R., to Sauder Industries, Inc. High temperature insulation module. 3,819,468, Cl. 161-152.000.
**Saunders, Allan L.,** to Automatic Radio Mfg. Co., Inc. Fine tuning and reset mechanism for tape players and the like. 3,820,159, Cl. 360-106.000.
**Saunders, Charles E.,** to Allen Group, Inc., The. Breakaway overhead car wash apparatus. 3,818,531, Cl. 15-21.00d.
**Savin Business Machines Corporation:** *See—*
Hastwell, Peter J.; and Gliddon, E. Barton, 3,819,942.
**Savino, Italo.** Automatic locking device for roller blinds. 3,819,217, Cl. 292-345.000.
**Savon Sellu Oy:** *See—*
Toivonen, Matti; Kettunen, Kyrki; and Salunen, Eero, 3,819,812.
**Sawano, Takahiro:** *See—*
Suenaga, Masanobu; Machii, Tetsuo; Sawano, Takahiro; Kobayashi, Takehiko; Dengo, Tadao; and Nakai, Tetsuzp, 3,818,584.
**Sayer, Raymond Oliver,** to Copper Refineries Pty. Limited. Method of, and entry-guide for, feeding stock to a rod-rolling reduction mill. 3,818,744, Cl. 72-250.000.
**Scales, John K.** Food storage and cooking bag and associated holder and dispensing element. 3,819,089, Cl. 222-95.000.
**Scan Coin AB:** *See—*
Nissmo, Jim Arthur; and Sundin, Jan Axel, 3,818,918.
**Scantlin, John R.,** to Transaction Technology Inc. Optical card reading system. 3,819,910, Cl. 235-61.11e.
**Schacher, Willi;** and Beck, Heinz-Jurgen, to Zahnradfabrik Friedrechshafen AG. Hydraulic clutch with constant operating stroke. 3,819,021, Cl. 192-111.00a.
**Schaefer, Jan Van Valkenburg.** Transistor power converter. 3,820,001, Cl. 321-2.000.
**Schaefer, William E.,** to Du Pont de Nemours, E. I., and Company. Blasting agent for blasting in hot boreholes. 3,819,429, Cl. 149-21.000.
**Schaffer, Bernhard:** *See—*
Giebler, Fritz; Moder, Hans-Ulrich; Rabold, Jurgen; and Schaffer, Bernhard, 3,820,077.
**Schaller, Kurt:** *See—*
Zaugg, Roland; Schaller, Kurt; and Bron, Alphonse, 3,818,692.
**Schank, Richard L.:** *See—*
Saeva, Franklin D.; and Schank, Richard L., 3,819,531.
**Schanze, Klaus:** *See—*
Johne, Albrecht; Forster, Karl Heinz; and Schanze, Klaus, 3,818,827.
**Schanzer, Gunther:** *See—*
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**Schaulfelberger, Roy Henry:** *See—*
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**Schering Aktiengesellschaft:** *See—*
Kerb, Ulrich; Kolb, Karl Heinz; and Klink, Gunter, 3,819,604.
Strehlke, Peter; and Redmann, Ulrich, 3,819,642.
Von Szczepanski, Christoph; Heindl, Joseph; Schroder, Eberhard; Kessler, Hans-Joachim; and Redmann, Ulrich, 3,819,717.
**Schering Corporation:** *See—*
Weinstein, Marvin J.; Luedwmann, George M.; Wagman, Gerald H.; and Marquez, Joseph A., 3,819,611.
**Scheuer, Fred F.,** to Dustikin Products, Inc. Treated paper and non-woven material for wiping surfaces and method therefor. 3,818,533, Cl. 15-104.930.
**Schild, A., S.A.:** *See—*
Zaugg, Roland; Schaller, Kurt; and Bron, Alphonse, 3,818,692.
**Schilling, Harald;** and Hoehn, Wolfgang, to ITT Industries, Inc. Monolithic integrated voltage stabilizer circuit with tapped diode string. 3,820,007, Cl. 323-8.000.
**Schirmann, Jean-Pierre;** and Weiss, Francis. Method for preparing oxaziridines. 3,819,653, Cl. 260-333.000.
**Schlaeppi, Hans P.,** to International Business Machines Corporation. Digital circuit for use as a frequency-to-DC transducer. 3,820,032, Cl. 328-133.000.
**Schmidt, Esther:** *See—*
Schmidt, Gerhard J. M.; Shabiai, Joseph; and Hirshfeld, Amiram, 3,819,578.
**Schmidt, Gerhard J. M.;** deceased (by Schmidt, Esther; legal representative); Shabiai, Joseph; and Hirshfeld, Amiram, to Yeda Research and Development Co., Ltd. Production of muconodinitrile. 3,819,578, Cl. 260-465.80r.
**Schmidt, Hans;** Eggert, Erwin; and Schuckle, Gert, to Gesellschaft fur Kernorschung mbH. Small axial thermocouple. 3,819,420, Cl. 136-228.000.
**Schmied, Arthur,** to Contraves AG. Apparatus for pressing a recording or engraving instrument against a surface moving relative thereto. 3,818,597, Cl. 33-18.00r.
**Schmitt, John A.:** *See—*
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**Schmitz, Guenter:** *See—*
Asselborn, Peter; Cramer, Werner; and Schmitz, Guenter, 3,819,073.
**Schmitz, Rudolf;** and Saerbeck, Baier, to Gardisette GmbH, Firma. Weighting band for curtains, drapes, or the like as well as for its manufacture. 3,818,970, Cl. 160-349.000.
**Schneble, Frederick W., Jr.;** Leech, Edward J.; and Polichette, Joseph, to Photocircuits Division of Kollmorgen Corporation. Protective coating for activated resinous substrates. 3,819,394, Cl. 117-6.000.
**Schneider, George,** to Amchem Products, Inc. Method for applying zinc phosphate coatings to metal surfaces. 3,819,422, Cl. 148-6.15z.
**Schneider, Jos., & Co., Optische Werke Kreuznach:** *See—*
Himmelsbach, Paul; and Faller, Werner, 3,820,096.
**Schneider, Thomas E.:** *See—*
Elders, Gerald W.; Schneider, Thomas E.; and Alongi, John R., 3,819,101.
**Schnekenburger, Emil;** and Schnekenburger, Rudolf. Control device for shifting brush body carriers on brush manufacturing machines. 3,818,774, Cl. 74-125.000.
**Schnekenburger, Rudolf:** *See—*
Schnekenburger, Emil; and Schnekenburger, Rudolf, 3,818,774.
**Schober, Wayne E.,** to Telex Communications, Inc., mesne. Cartridge loading and positioning mechanism for tape playing device. 3,820,158, Cl. 360-96.000.
**Schoendube, Charles W.,** to General Electric Company. Cooling systems especially for dry type induction regulators. 3,819,965, Cl. 310-58.000.
**Scholes, Addison B.;** and Kozlowski, Joseph J., to Ball Corporation. Method for treating vitreous surfaces. 3,819,404, Cl. 117-106.00r.
**Schoonover, Richard H. A.,** to Tormac International, Inc. Land clearing and tree planting site preparation apparatus. 3,818,957, Cl. 144-34.00r.
**Schramm, Richard A.** Modular building structure with horizontal vierendeel truss. 3,818,654, Cl. 52-79.000.
**Schreiner, Siegfried;** Lukas, Siegmar; and Poschmann, Franz, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Stabilized sodium dithionite compositions. 3,819,807, Cl. 423-265.000.
**Schreter, Robert E.,** to Hauck Manufacturing Company. Industrial pulution control systems and components thereof. 3,819,319, Cl. 431-5.000.
**Schreyer, Gerd:** *See—*
Giesselmann, Gunter; Monch, Heinz; Schreyer, Gerd; and Weiberg, Otto, 3,819,818.
**Schroder, Eberhard:** *See—*

Von Szczepanski, Christoph; Heindl, Joseph; Schroder, Eberhard; Kessler, HanspJoachim; and Redmann, Ulrich, 3,819,717.

Schroeder, Alfred C.: *See—*
Pritchard, Dalton H.; and Schroeder, Alfred C., 3,820,157.

Schubert, Howard C., to Aerolite Electronics Corporation. Premises entry and exit signaling system. 3,820,102, Cl. 340-276.000.

Schubert, Warren Robert; and Marshall, James Richard, to Colgate-Palmolive Company. Cosmetic composition for thermal dispensing. 3,819,524, Cl. 252-90.000.

Schuckle, Gert: *See—*
Schmidt, Hans; Eggert, Erwin; and Schuckle, Gert, 3,819,420.

Schudel, Peter: *See—*
Bozzato, Giuliano; Pesaro, Mario; Schudel, Peter; Hug-Inderbitzin, Marianne; and Erickson, Robert Edward, 3,819,711.
Lamparsky, Dietmar; and Schudel, Peter, 3,819,712.

Schuder, Maurice E.: *See—*
Homan, William N.; Schuder, Maurice E.; and Stafford, Richard W., 3,819,886.

Schuder, Paul S. Bearing stress pad for beds, or the like. 3,818,519, Cl. 5-317.00r.

Schuetzenduebel, Wolfram Gerhard: *See—*
Clayton, William Harold, Jr.; and Schuetzenduebel, Wolfram Gerhard, 3,818,872.

Schuller, James T.; and Lee, Gerry A., to UMC Industries, Inc. Article-dispensing apparatus. 3,819,087, Cl. 221-123.000.

Schultes, Tilman; Keulen, Werner; and Rottner, Gunter. Pocket umbrella. 3,818,919, Cl. 135-20.00r.

Schultz, Hugo C., to Penn Corporation. Retractable pen. 3,819,282, Cl. 401-105.000.

Schultz, John E., to International Machine Products, Inc. Arrangement for supplying ink for a printing machine. 3,818,830, Cl. 101-350.000.

Schultz, John E., to International Machine Products, Inc. Heavy duty plate roll. 3,818,831, Cl. 101-375.000.

Schultz, Ronald G., to United States Steel Corporation. Control system for torch current in a plasma arc furnace. 3,819,840, Cl. 13-1.000.

Schulz, Axel, to Bosch, Robert, Fernschanlagen GmbH. Method and arrangement for automatic phase and amplitude control in a vectorscope. 3,820,156, Cl. 358-10.000.

Schulz, Gunter: *See—*
Imme, Helmut; Blaimberger, Robert; and Schulz, Gunter, 3,819,169.

Schulz, Paul L.: *See—*
Kenreich, Richard R.; Schulz, Paul L.; Houck, Albert; and Kretchman, Gerald L., 3,818,729.

Schumacher, Walter Carl, to General Electric Company. Seal off around GE3952 lamp. 3,819,923, Cl. 240-1.00r.

Schumichen, Helmut; and Muller, Gerhard, to Oxy Metal Finishing Corporation. Method for applying a phosphate coating to iron and steel. 3,819,385, Cl. 106-14.000.

Schuster, Samuel J. Sample bag. 3,819,106, Cl. 229-62.000.

Schuter, Wilhelm, to Calottan AG. Laminar cushion. 3,818,522, Cl. 5-347.000.

Schutz, Erich, to Metallgesellschaft Aktiengesellschaft. Method for casting blocks. 3,818,971, Cl. 164-4.000.

Schwarzschiid, Gunter J., to Timex Corporation. Stepping motor for watch movement. 3,818,690, Cl. 58-23.00d.

Schweizer, Gottfried: *See—*
Smolka, Thomas Gordon; and Schweizer, Gottfried, 3,819,199.

Schweizer, Gottfried; and Smolka, Thomas Gordon, to Gertsch AG, mesne. Sole support device. 3,819,200, Cl. 280-11.35c.

Schwieter, Ulrich: *See—*
Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, 3,819,655.

Scientific Components, Inc.: *See—*
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SCM Corporation: *See—*
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Markakis, Michael J., 3,819,024.

Scott, George William Pearson; and Lloyd, Kenneth Henry, to Severn Pumps Limited. Pumps. 3,818,803, Cl. 91-499.000.

Scott Paper Company: *See—*
Shaw, David L.; and Wodka, Edward A., 3,819,470.

Scotto, Arthur J. Implement for affixing metal pick to flower stem. 3,818,573, Cl. 29-212.00d.

Scripps-Clemans, Inc.: *See—*
Butler, Lawrence W.; and Banks, Roger W., 3,819,258.

Scurlock, Ralph, Geoffrey, to National Research Development Corporation. Heat-insulating constructions. 3,818,715, Cl. 62-45.000.

Searle, G. D., & Co.: *See—*
Lenz, George R., 3,819,687.
Tweit, Robert C., 3,819,646.

Seely, Robert W.; and Nalley, David J., to Singer Company, The. Mounting assembly for a shaft of a power tool. 3,818,778, Cl. 74-421.00a.

Sefton, Robert C., to Koppers Company, Inc. Additive for cementitious mixtures. 3,819,391, Cl. 106-273.00r.

Seidel, William B., to Babcock & Wilcox Company, The. Grinding machine. 3,818,642, Cl. 51-165.800.

Seigenji, Kiyoshi: *See—*
Aimi, Mitsuo; and Seigenji, Kiyoshi, 3,819,275.

Seiler, Claus-Dietrich: *See—*
Plankl, Leo Hans; Seiler, Claus-Dietrich; and Vahlensieck, Hans-Joachim, 3,819,400.

Seitzer, Walter H.; and Shinn, Robert W., to Sun Research and Development Co. Coal dissolving process. 3,819,506, Cl. 208-8.000.

Seitzer, Walther H.: *See—*
Borkowski, Walter L.; Van Venrooy, John J.; and Seitzer, Walther H., 3,819,732.

Seki, Yasuo: *See—*
Yoshida, Yoshinaga; Kobayashi, Shigehiko; Miyazaki, Kazuhide; Yamamoto, Michiaki; and Seki, Yasuo, 3,819,334.

Seltzer, Raymond; and Considine, William, to M&T Chemicals Inc. Salts of cyaniminodithiocarbonic acid which are fungicidal agents. 3,819,576, Cl. 260-45.75k.

Semancik, Joseph S.: *See—*
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Semchenko, Vitaly Vasilievich: *See—*
Kozorezov, Konstanti Isaakovich; Semchenko, Vitaly Vasilievich; Biteryakov, Viktor Vasilievich; Mikhailu, Georgy Ivanovich; and Skugorova, Ninel Fedorovna, 3,819,890.

Semple, Charles A., to Engineered Concrete Placer, Inc. Slurry pump piston seal. 3,818,807, Cl. 92-86.500.

Sendoykas, Jack J.; and McPherson, Alexander W., to Dover Corporation (De-Sta-Co Division). Plunger clamp. 3,819,171, Cl. 269-228.000.

Seng, Florin; Ley, Kurt; and Georg, Karl, to Bayer Aktiengesellschaft. New imines, their preparation and their pharmaceutical use. 3,819,616, Cl. 260-240.00g.

Sennstrom, Harold R., to Teledyne Mid-America Company. Apparatus for forming heat exchangers. 3,818,568, Cl. 29-202.00d.

Sentralinstitutt for Industriell Forskning: *See—*
Eriksen, Odd, 3,818,765.

Serio, John P.: *See—*
Chatterji, Arun K.; Marianne, Custazzo; Demosthemes, Kiriazides K.; Russell, John J., Jr.; and Serio, John P., 3,819,367.

Severn Pumps Limited: *See—*
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Sexton, James H.; Patton, Bobbie J.; and Harrell, John W., to Mobil Oil Corporation. Logging-while-drilling encoder. 3,820,063, Cl. 340-18.0ld.

Shabiai, Joseph: *See—*
Schmidt, Gerhard J. M.; Shabiai, Joseph; and Hirshfeld, Amiram, 3,819,578.

Shafer, Homer J. Dual cylinder operator for imparting rotary motion. 3,818,808, Cl. 92-138.000.

Shaffer, Kenneth F.; and Arnold, Irvin G., Jr., to Diamond Shamrock Corporation. Alkali metal chromate production. 3,819,800, Cl. 423-58.000.

Shaffer, Paul D.; and Plank, David C., to PPG Industries, Inc. Apparatus for press bending an aperture glass sheet. 3,819,351, Cl. 65-273.000.

Shakespear, Horacio, to General Motors Corporation. Semirigid shoulder belts. 3,819,197, Cl. 280-150.0sb.

Sharman, Samuel H.: *See—*
Kurkov, Victor P.; and Sharman, Samuel H., 3,819,691.

Sharman, Samuel H.; House, Ralph; and Anderson, Glen W., to Chevron Research Company. Foam circulation fluids. 3,819,519, Cl. 252-8.50c.

Sharp, Kennedy H.; Stuart, William L.: *See—*
Johnson, Winston O.; and Davis, David W., 3,819,947.

Sharpe, Anthony Nelson; and Jackson, Adrian Keith, to Lever Brothers Company. Devices for blending materials. 3,819,158, Cl. 259-72.000.

Sharpe, Thomas R. Antiinflammatory 4-aryl-4-hydroxyallophanates. 3,819,681, Cl. 260-471.00c.

Shaw, David L.; and Wodka, Edward A., to Scott Paper Company. Modified cellulosic fibers and method for preparation thereof. 3,819,470, Cl. 162-157.00c.

Sheely, Harold R., to Badger Company, Inc., The. Manufacture of unsaturated nitriles. 3,819,679, Cl. 260-469.300.

Shelef, Mordecai: *See—*
Dalla, Betta, Ralph A.; Gandhi, Haren S.; Kummer, Joseph T.; and Shelef, Mordecai, 3,819,536.

Shell Oil Company: *See—*
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Stephens, Roger W.; Vervloet, Christiaan; and Monnee, Hugo C. W., 3,819,553.
van der Voort, Henricus G. P., 3,819,579.

Shen, Tsung-Ying; Fordice, Michael W.; Ruyle, William V.; and Jensen, Norman P., to Merck & Co., Inc. Sulfaguanidines. 3,819,603, Cl. 260-239.600.

Shen, Tsung-Ying; and Jones, Howard, to Merck & Co., Inc. Sulfonyl or sulfinyl substituted indenyl alcohols. 3,819,716, Cl. 260-607.00a.

Shepard, David H., to Cognitronics Corporation. Character reading system controlled by preprinted program control characters on document form. 3,820,067, Cl. 340-146.30b.

Shephard, Robert: *See—*
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Sherlock, Hugh Paul: *See—*
Uitz, Mark O.; Ewry, Edwin E.; Link, William T.; and Sherlock, Hugh Paul, 3,819,257.

Shersher, Yakov Isaevich. Artificial hip-joint with detachable insert. 3,818,512, Cl. 3-1.000.

Shiborin, Viktor Ivanovich: *See—*

Baturov, Vladimir Ivanovich; Prilutsky, Yakov Khaimovich; Shiborin, Viktor Ivanovich; and Shkoropad, Dmitry Evseevich, 3,819,110.
Shikoku Kakooki Co., Ltd.: *See—*
Wakabayashi, Shigeru, 3,818,785.
Shim, Kyung S., to Stauffer Chemical Company. Polyalkylene glycol vinyl phosphates. 3,819,750, Cl. 260-929.000.
Shima, Takeo: *See—*
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Shima, Takeo; Kobayashi, Takayuki; Kawase, Shoji; and Kurisu, Shizuka, to Teijin Limited. Process for preparation of polyesters. 3,819,584, Cl. 260-75.00m.
Shimada, Katsutoshi: *See—*
Inai, Yuichi; Okazaki, Kanzo; Uchiyama, Mikio; Shimada, Katsutoshi; Kagei, Kengo; and Bessho, Motoaki, 3,819,705.
Shimanckas, William J., to Outboard Marine Corporation. Marine propulsion reversing mechanism. 3,818,855, Cl. 115-34.00r.
Shimauchi, Shiro; Minemura, Norihiro; Matsui, Takesha; Ito, Kenji; Shima, Takeo; and Oshima, Masataka, to Teijin Limited. Phosphonium salt assisted dyeing with anionic dyes or polyamide-polyester fibers. 3,819,326, Cl. 8-171.000.
Shimizu, Hiroshi; Sakakibara, Shunsaku; and Ishigura, Ryoichi, to Agency of Industrial Science & Technology. Method and apparatus for producing watch crystals. 3,819,349, Cl. 56-63.000.
Shimizu, Morio: *See—*
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Shimizu, Yoshiaki; Akiyama, Yoshiyuki; and Tatano, Toshio, to Kyowa Hakko Kogyo Kabushiki Kaisha. Process for preparing nicotinamide adenine dinucleotide phosphate. 3,819,481, Cl. 195-28.00n.
Shimoma, Takashi: *See—*
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Shimomura, Takatoshi; Nagata, Hideo; Murakami, Yoshiaki; Sanno, Haruyoshi; and Inoue, Tadanori, to Sumitomo Chemical Company, Ltd. Process for producing block copolymer. 3,819,767, Cl. 260-880.00b.
Shimura, Hirofumi: *See—*
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Shu, Ping; and Dann, Murray, to American Cyanamid Company. Method for the production and isolation of antibiotic AV290 sulfate. 3,819,836, Cl. 424-124.000.
Shuji, Irie: *See—*
Aito, Yuzo; Fujii, Takeshi; Saiki, Noritsugu; Shuji, Irie; and Yasujuni, Nakatsuji, 3,819,760.
Shulda, Raymond E.: *See—*
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Shults, Thomas B. Trotline reel. 3,818,625, Cl. 43-27.400.
Shulz, Robert J.; and Kozinczuk, Orest A., to Innovative Process Equipment, Inc. Pressure cooking system. 3,818,819, Cl. 99-330.000.
Shuto, Yasusuke: *See—*
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SI Handling Systems, Inc.: *See—*
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Sickinger, Hans, Company: *See—*
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Sidbeck, Paul R.; and Weinstein, Daniel S., to North American Rockwell Corporation. Pattern welding control device. 3,819,902, Cl. 219-125.0pl.
Siddall, John B.; and Calame, Jean Pierre, to Zoecon Corporation. Hydroxy substituted unsaturated acids and esters and derivatives thereof. 3,819,667, Cl. 260-405.000.
Siegle, Peter: *See—*
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Siegrist, Rudolf: *See—*
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Sievers, Robert W., to Motion Manufacturing Inc. Adjustable length cam shuttle. 3,818,770, Cl. 74-57.000.
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Signetics Corporation: *See—*
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Silberschlag, Russell E., to Borg-Warner Corporation. Floating caliper disc brake. 3,819,015, Cl. 188-73.300.
Silbert, Leonard S.; and Konen, Dolores A., to United States of America, Agriculture. Process for the preparation of peroxy acids. 3,819,688, Cl. 260-502.00r.
Simeth, Claus: *See—*
Presuss, Friedrich; and Simeth, Claus, 3,819,032.
Simmons, John T., Jr. End of page singal device for a typewriter. 3,819,029, Cl. 197-189.000.
Simon, Mildred Rackley. Transverse shoe stretcher. 3,818,527, Cl. 12-115.600.
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Simonte, Antonino: *See—*
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Simpson, William R., to Sandoz-Wander, Inc. 2-Phenyl-4-substituted amino-quinazolines and nitrated thereof. 3,819,628, Cl. 260-256.40q.
Sims, Marc J., to Chevron Research Company. Lubricant containing dispersed borate and a polyol. 3,819,521, Cl. 252-18.000.
Sinclair, Suzanne E. Animal commode. 3,818,865, Cl. 119-1.000.
Singer Company (U.K.) Ltd., The: *See—*
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Sivertsen, Georg Sigurd: *See—*
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Skelley, John W. Manual transmission shift control. 3,818,779, Cl. 74-473.00r.
SKF Industrial Trading and Development Co.: *See—*
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Skinner, James R., to M.U. Engineering & Mfg., Inc. Filter cup construction. 3,819,055, Cl. 210-232.000.
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Slaght, William F., to Her Majesty the Queen in right of Canada, Minister of National Defence. Medical data terminal for transmitting analogue and digital data. 3,819,863, Cl. 179-2.0dp.

Slaven, Ernest Lynn. Wall module. 3,818,658, Cl. 52-169.000.

Slominski, Leo J.: *See*—
Grunwald, John J.; Rhodenizer, Harold L.; and Slominski, Leo J., 3,819,497.

Slovacek, Raymond J.: *See*—
Horn, Robert; and Slovacek, Raymond J., 3,819,922.

Smernoff, Ronalld B., to Analytical Products, Inc. Article positioning device. 3,819,042, Cl. 206-443.000.

Smit, Henry, 50% to Tassell, Leslie E. Safety apparatus for presses. 3,818,748, Cl. 72-448.000.

Smit Nijmegen Electrotechnische Fabrieken N.V.: *See*—
Van Riemsdijk, Gerardus Andriaan, 3,818,747.

Smith, Alan B.; and Goller, Warren W., to Sperry Rand Corporation. Method and means for reducing domain pinning in magnetic wall domain devices. 3,820,093, Cl. 340-174.0tf.

Smith, Everett C.: *See*—
Southwick, Russell D.; and Smith, Everett C., 3,819,346.

Smith, Harris L. Trestle for a flexible hose. 3,819,137, Cl. 248-49.000.

Smith, Harry A., to Dow Chemical Company, The. Epoxy resin compositions containing aromatic disulfonamide salts. 3,819,581, Cl. 260-47.0en.

Smith International, Inc.: *See*—
Garrett, William R., 3,818,999.

Smith, John. Lamp housing and electrical terminal construction. 3,820,060, Cl. 339-220.00l.

Smith, Lyle B., to General Motors Corporation. Fluid operated starting clutch with centrifugally actuated control valves. 3,819,020, Cl. 192-103.0fa.

Smith, Ross Alexander; and Lambrou, Andreas, to Bush Boake Allen Limited. Encapsulated flavoring composition. 3,819,838, Cl. 426-89.000.

Smith, Stephen Hagar, to McCulloch Corporation. Method and transformer/motor for charging batteries. 3,820,000, Cl. 320-2.000.

Smith, Thomas W., to McNeil Corporation. Method and apparatus for controlling the cure of a rubber article. 3,819,915, Cl. 235-151.000.

Smith, Ward C., to Corning Glass Works. Identification system. 3,818,897, Cl. 128-2.00f.

Smith, William E. Line pulling apparatus. 3,819,155, Cl. 254-175.500.

Smith, William Russell, to General Electric Company. Apparatus for pouring molten metal from a ladle. 3,818,985, Cl. 164-300.000.

Smithers, Michael James: *See*—
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Smithlin, John R., to United States of America, Navy. Method and apparatus for decoding a manchester waveform. 3,820,031, Cl. 328-119.000.

Smolka, Thomas Gordon: *See*—
Schweizer, Gottfried; and Smolka, Thomas Gordon, 3,819,200.

Smolka, Thomas Gordon; and Schweizer, Gottfried, to Gertsch AG, mesne. Ski binding. 3,819,199, Cl. 280-11.35m.

Smucker, Clayton A.: *See*—
Fargo, Harland E.; and Smucker, Clayton A., 3,819,441.

Snitzer, Morton: *See*—
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Snover, John A.: *See*—
Daniels, Roger D.; and Snover, John A., 3,819,335.

Snyder, Ira D. Device for retaining a golfer's accouterments. 3,819,095, Cl. 224-5.00c.

Societa Italiana Resine S.p.A.: *See*—
Ackermann, Jacob; and Radici, Pierino, 3,819,573.

Societa Italiana Telecomunicazioni Siemens S.p.A.: *See*—
Lamartina, Alfonso; Cicognani, Enrico; Caldarella, Riccardo; and Antonini, Athos, 3,819,869.

Societe Anonyme D.B.A.: *See*—
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Societe anonyme dite: L'Oreal: *See*—
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Societe Anonyme dite: Orsymonde: *See*—
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Societe Civile Auguil: *See*—
Dvolaitzky, Frajda; Cognacq, Jean-Claude; and Ber, Esther, 3,819,723.

Societe d'Aerodynamique et de Thermodynamique: *See*—
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Societe Dauphinoise Electrique: *See*—
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Societe d'Exploitation des Bevets Nieman: *See*—
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Societe Genevoise d'Industruments de Physique: *See*—
Loulicovitch, Maurice; and Georgiou, Jean, 3,819,274.

Societe Nouvelle des Bennes Saphem: *See*—
Derain, Christian, 3,819,075.

Soderman, Claes Erik, to Atlas Copco Aktiebolag. Electrostatic spray gun. 3,819,115, Cl. 239-15.000.

Soehngen, John W., to Celanese Corporation. Apparatus for the production of spray spun nonwoven sheets. 3,819,452, Cl. 156-441.000.

Sohnemann, Richard, to Continental Gummi-Werke Aktiengesellschaft. Printing blanket, especially for offset printing. 3,819,471, Cl. 161-162.000.

Soldatov, Nikolai Konstantinovich: *See*—
Leonov, Oleg Borisovich; Arapov, Viktor Viktorovich; Pavljukov, Vladimir Grigorievich; Oblasti, Zhukovsky Moskovskoi; Patrakhaltsev, Nikolai Nikolaevich; Manuilov, Nikolai Nikolaevich; and Soldatov, Nikolai Konstantinovich, 3,818,882.

Sonobe, Noriyoshi: *See*—
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Kajiwara, Toshiyuki; Sonobe, Noriyoshi; Nishi, Hidetoshi; and Hayashi, Masahiro, 3,818,743.

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Sopchak, Peter: *See*—
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Sorbie, Thomas B., to Owens-Illinois, Inc. Bottle gauging apparatus and method. 3,819,047, Cl. 209-80.000.

Sorvall, Ivan, Inc.: *See*—
Romanauskas, William A.; and Paulsen, W. Charles, 3,819,111.

Southwick, Russell D.; and Smith, Everett C., to Glass Container Manufacturers Institute, Inc. Method for applying an inorganic tin coating to a glass surface. 3,819,346, Cl. 65-24.000.

Southwire Company: *See*—
Berry, Milton E., 3,818,972.

Sovijarvi, Arvi A. I.; and Jaronen, Niilo N. Apparatus and method for making X-ray films. 3,819,937, Cl. 250-505.000.

Spectra-Strip Corporation: *See*—
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Spectroderm Inc.: *See*—
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Spectrotherm Corporation: *See*—
Dickson, Colin G., 3,820,135.

Spedden, Henry Rush; and Malouf, Emil Edward, to Kennecott Copper Corporation. Cyclic leach-precipitation process for recovering copper values from bodies of ore material containing copper minerals. 3,819,797, Cl. 423-27.000.

Speers, Daniel Earle, to General Film Development Corporation. Fine grain high speed photographic processing monobath composition. 3,819,378, Cl. 96-61.00m.

Spencer, Raymond Anthony Philip: *See*—
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Sperry Rand Corporation: *See*—
Hoque, Abul M. M.; and Cullen, Michael J., 3,819,281.
Smith, Alan B.; and Goller, Warren W., 3,820,093.

Spezial, Ronald: *See*—
Nesson, Israel; Faris, Edwin E.; and Spezial, Ronald, 3,820,146.

Spiegel Industries Corporation: *See*—
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Spink, John: *See*—
Kaestner, Erwin A.; and Spink, John, 3,819,329.

Spiro, Irving. Elastic exercise belt. 3,819,177, Cl. 272-82.000.

Spring Chemicals Limited: *See*—
Robinson, Murray Clinton, 3,819,802.

Square D Company: *See*—
Hughes, Ronald W.; Messick, Mikel Jay; and Volpe, John Rodgers, 3,819,956.
Layton, Beryl W.; and Weaver, William J., 3,820,046.

Squibb, E. R., & Sons, Inc.: *See*—
Dursch, Friedrich; and Siewarga, Theodore Michael, 3,819,620.
Haugwitz, Rudiger Dieter; and Narayanan, Venkatachala Lakshmi, 3,819,618.
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Levine, Seymour D.; and Principe, Pacifico A., 3,819,693.
Ondetti, Miguel Angel, 3,819,831.

Squire, Elaine Josephine; and Ezekiel, Aaron David, to Ilford Limited. Super-sensitising combination in photographic silver halide emulsion. 3,819,383, Cl. 96-124.000.

St. John, Douglas F.: *See*—
Pellett, Fred G.; Richards, Raymond S.; Rough, Robert R.; St. John, Douglas F.; and Wengert, Paul R., 3,819,350.

St. John, Peter A.; and Goldsmith, Herbert, to Baxter Laboratories, Inc. Flared ferrule tube end fitting. 3,819,212, Cl. 285-356.000.

St. Pierre, Richard; and Halpern, Melvin A., to Celanese Corporation. Centrifugal spray apparatus. 3,818,863, Cl. 118-323.000.

St. Regis Paper Company: *See*—
Coale, Thomas E.; Gunn, Sidney W.; Merrigan, Frank; and Tompkins, Donald M., 3,818,832.

Stafford, Richard W.: *See*—
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Standard Forge and Axle Company, Incorporated: *See*—
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Standard Oil Company: *See*—
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Albertins, Rusins; and Stasiewicz, Michael A., 3,819,510.
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Cahill, Paul J.; and Kurasiewicz, Adam S., 3,819,660.
Fotis, Peter; and Boone, David E., 3,819,599.
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Standard Oil Company, The: *See*—
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Standard Products Co., The: *See*—
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Stapert, James, Jr.: *See—*
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Star-New Era, Inc.: *See—*
Sinnott, David J.; and Allecci, Donald E., 3,820,127.
Stark, Clarence C.: *See—*
Barrera, Carlos M.; Stark, Clarence C.; and Stark, Clarence C., 3,818,877.
Starkey, Bertrand J., to Hermes Electronics Limited. Deep-sea slack wire mooring system. 3,818,524, Cl. 9-8.00r.
Starr, John R.; and Drennan, Arthur P., to Cotton, Incorporated. Primary backing for tufted carpets. 3,819,462, Cl. 161-62.000.
Stasiewicz, Michael A.: *See—*
Albertins, Rusins; and Stasiewicz, Michael A., 3,819,510.
Stastny, Fritz; Trieschmann, Hans-Georg; and Gaeth, Rudolf, to BASF Aktiengesellschaft. Production of chlorinated polyethylene foams. 3,819,543, Cl. 260-2.5ha.
Stauffer Chemical Company: *See—*
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Pitt, Harold M.; and Bender, Harry, 3,819,731.
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Ste. Calais, Bernard S.a.r.L.: *See—*
Calais, Bernard; and Vidal, Luis, 3,818,636.
Steelcase Inc.: *See—*
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Steele, Roger B.: *See—*
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Stefan, Frank N.: *See—*
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Steigerwald, Robert L., to General Electric Company. Inverter with constant duty cycle control. 3,820,005, Cl. 321-18.000.
Stein, Michel Guy Pierre, to Telecommunications Radioelectriques et Telephoniques T.R.T. System for synchronous data transmission through a digital transmission channel. 3,819,853, Cl. 178-68.000.
Stemple, James M.; and Allen, Paul E., to Bendix Corporation, The. Counterbalance for a vertically supported probe shaft. 3,818,596, Cl. 33-1.00m.
Stenzel, Gunter: *See—*
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Stephens, Roger W.; Vervloet, Christiaan; and Monnee, Hugo C. W., to Shell Oil Company. Stabilized thermoplastic polyurethane composition. 3,819,553, Cl. 260-28.000.
Stephenson, Robert L.: *See—*
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Sterling Drug Inc.: *See—*
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Stevens, J. P., & Co., Inc.: *See—*
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Stevens, Keith Drummond: *See—*
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Stevens, Robert W.: *See—*
Egan, Dale W.; Holstrom, Geoffrey B.; Lord, Harry C.; Stevens, Robert W.; Port, Darrell P.; and Howard, Rollen D., 3,819,945.
Stevenson, David A.; Rhines, Walden C.; and Maruska, Herbert P. Gallium nitride metal-semiconductor junction light emitting diode. 3,819,974, Cl. 313-499.000.
Stevenson, John L.; and Archibald, William E., to Cosden Oil & Chemical Company. Distillation of aromatic ketone from aromatic alcohol with acid. 3,819,492, Cl. 203-34.000.
Stewart, Arthur H. Appliance for paint cans or the like. 3,819,140, Cl. 248-110.000.
Stewart, John Stewart Simpson. Oligaemic shock assessment apparatus. 3,818,895, Cl. 128-2.00f.
Stewart, Peter H.: *See—*
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Stewart Plastics Limited: *See—*
Dugan-Chapman, Charles, 3,818,634.
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Stillman, Stephen L., Jr., to Sanders Associates, Inc. Subsurface current utilizing buoy system. 3,818,523, Cl. 9-8.00r.
Stockton, Richard B.: *See—*
Stockton, Richard B.; Hunter, Roger A.; and Croy, Milton G. (said Croy and said Hunter assors. to said), 3,819,873.
Stockton, Richard B.; Hunter, Roger A.; and Croy, Milton G., said Croy and said Hunter assors. to said Stockton, Richard B. Telephone call indicator. 3,819,873, Cl. 179-84.00l.
Stoessel, Hermann V.; and Kountz, Jack M., to Hesston Corporation. Forage harvester having header mounter feeder rolls. 3,818,685, Cl. 56-98.000.
Stoffel, Robert W., to International Engineering Service, Inc. Seat belt retractor with gear wheel actuated locking means. 3,819,126, Cl. 242-107.400.
Stoll, H., and Company: *See—*
Hadam, Wilhelm; and Goller, Ernst, 3,818,727.
Kazmeier, Gunther; and Hadam, Wilhelm, 3,818,726.
Stone, Neil. Navigational receiver failure warning system. 3,820,115, Cl. 343-107.000.
Stop-Loss Incorporated: *See—*
Fearon, Edward R., 3,820,104.
Stop-Loss Incorporated, mesne: *See—*
Fearon, Edward R., 3,820,103.
Stouthamer, Bernhard: *See—*
Kwantes, Arien; and Stouthamer, Bernhard, 3,819,728.
Stratton & Terstegge Co., Inc.: *See—*
Dew, Robert C., 3,818,891.
Strauss, Walter: *See—*
Bobeck, Andrew Henry; Ciak, Frank John; and Strauss, Walter, 3,820,092.
Strehlke, Peter; and Redmann, Ulrich, to Schering Aktiengesellschaft. 2-(5-Nitro-2-thiazolyl)-benzimidazoles. 3,819,642, Cl. 260-302.00h.
Strelitz, Justina: *See—*
Roth, Barbara; and Strelitz, Justina, 3,819,629.
Strickle, Erich: *See—*
Dassler, Rudolf; Dreier, Horst; Strickle, Erich; and Muller, Norbert, 3,818,617.
Stritzko, Vilem, to Bleiche AG. Method and arrangement for controlling the tensioning force in an advancing yarn. 3,819,097, Cl. 226-39.000.
Stroll, H., and Company: *See—*
Bauknecht, Gunter; Hadam, Wilhelm; and Ploppa, Jurgen, 3,820,082.
Stuart, Charles E. Dental articulator. 3,818,595, Cl. 32-32.000.
Stubbs, James M. Apparatus for controlling eating and smoking habits. 3,818,906, Cl. 128-136.000.
Stubits, Marcella C.: *See—*
Teng, James; and Stubits, Marcella C., 3,819,390.
Stubss, Dennis: *See—*
Maltby, Jack; and Stubss, Dennis, 3,818,742.
Stunkard, Gerald A., to DND Corporation. Self centering pipe working machine. 3,819,163, Cl. 266-23.0nn.
Subers, John E., Jr.: *See—*
Rush, Michael M.; Subers, John E., Jr.; and Herring, Peter C., 3,819,855.
Submarine Engineering Associates, Inc.: *See—*
Benson, Robert A., 3,818,708.
Suchy, Milos: *See—*
Chodnekar, Madhukar Subraya; Pfiffner, Albert; Rigassi, Norbert; Schwieter, Ulrich; and Suchy, Milos, 3,819,655.
Sudmeier, Gustav H. Subsurface continuous-wave exploration system. 3,820,010, Cl. 324-.50r.
Suenaga, Masanobu; Machii, Tetsuo; Sawano, Takahiro; Kobayashi, Takehiko; Dengo, Tadao; and Nakai, Tetsuzp, to Tokyo Shibaura Electric Co., Ltd. Method for manufacturing a semiconductor apparatus. 3,818,584, Cl. 29-588.000.
Sugano, Hiroshi; Tsushima, Ken; Sato, Kurayoshi; and Araikawa, Noboru, to Mitsubishi Jukogyo Kabushiki Kaisha. Control for hydraulic machine having adjustable blades. 3,819,296, Cl. 416-157.000.
Sugiura, Akio; and Okamoto, Atsutoshi, to Nippondenso Co., Ltd. Direct current voltage supply apparatus. 3,820,004, Cl. 321-15.000.
Sugiyama, Minoru: *See—*
Tokumitsu, Ichiro; Takemura, Toshisada; Sugiyama, Minoru; Nishiyama, Kenji; Ogawa, Shigeo; and Okiyama, Sadao, 3,818,975.
Sulzberger, Johann: *See—*
Weigele, Gebhard; and Sulzberger, Johann, 3,819,991.
Sumilas, John W.: *See—*
Chang, Joseph J.; and Sumilas, John W., 3,819,959.
Sumitani, Hideo: *See—*
Ohyama, Yasushi; and Sumitani, Hideo, 3,819,379.
Sumitomo Chemical Company, Ltd.: *See—*
Okuno, Yositosi, 3,819,823.
Shimomura, Takatoshi; Nagata, Hideo; Murakami, Yoshiaki; Sanno, Haruyoshi; and Inoue, Tadanori, 3,819,767.
Sun Chemical Corporation: *See—*
Simons, Herbert D.; and Timmons, Frank E., 3,819,443.
Sun Oil Company: *See—*
Ratledge, Edward; and Ware, Richard E., 3,819,530.
Sun Oil Company (Delaware): *See—*
McCaleb, Stanley B., 3,818,996.
Sun Research and Development Co.: *See—*
Oishi, Masayoshi, 3,819,507.
Seitzer, Walter H.; and Shinn, Robert W., 3,819,506.
Sun Research and Development Co., mesne: *See—*
Borkowski, Walter L.; Van Venrooy, John J.; and Seitzer, Walther H., 3,819,732.
Moore, Robert E.; and Driscoll, Gary L., 3,819,721.
Sundin, Jan Axel: *See—*
Nissmo, Jim Arthur; and Sundin, Jan Axel, 3,818,918.
Suresh, Dev D.: *See—*
Grasselli, Robert K.; and Suresh, Dev D., 3,819,685.
Sussman, Philip S.: *See—*
Andrews, Francis W.; Sussman, Philip S.; and Barlow, Sidney D., 3,819,285.
Sutch, Richard D.: *See—*
Argyle, John F.; Medowski, Glenn O.; Ports, David W.; and Sutch, Richard D., 3,819,785.
Sutton, Robert A.: *See—*
Pillar, Walter O.; and Sutton, Robert A., 3,819,547.
Suzuki, Isao: *See—*
Moroto, Kaoru; and Suzuki, Isao, 3,819,885.
Suzuki, Kazuo: *See—*
Fushida, Yoshio; Suzuki, Kazuo; Kasahara, Kakaaki; Okawa, Kazuyoshi; and Ashizawa, Masayoshi, 3,819,025.

Suzuki, Takashi; and Kirakawa, Hoichi, to Matsushita Electric Industrial Co., Ltd. Method for manufacturing electrical apparatus. 3,819,446, Cl. 156-291.000.

Suzuki, Yoshihiro: *See—*
Ishihara, Shiya; and Suzuki, Yoshihiro, 3,819,308.

Svensson, Lars Erik; and Julin, Gustav, to Safer Marketing Aktiebolag. Safety guard device for power presses and the like. 3,819,022, Cl. 192-134.000.

Sverre Munck A/S: *See—*
Mortensen, Kjell Sverre, 3,819,014.

Swanson, Ralph G.; and Walus, Aloysius N., to Du Pont de Nemours, E. I., and Company. Sealer composition of an acrylic-epoxy ester graft copolymer and an epoxy resin. 3,819,567, Cl. 260-42.280.

Swatman, Peter R.; and Tullett, John Edgar, to British Leyland (Austin-Morris) Limited. Carburettors for internal combustion engines. 3,819,159, Cl. 261-44.00r.

Swenney, Donald E., Jr.; and Hopkins, Walker L., to Texaco Inc. Means and method for controlling the hydrocarbon content of recycle acid in an alkylation unit. 3,819,917, Cl. 235-151.120.

Swift & Company: *See—*
Pichel, Michael J., 3,819,839.

Swilley, Wilson H., to Cincinnati Butchers Supply Company, The, mesne. Switch mechanism for overhead trolley. 3,818,836, Cl. 104-100.000.

Swithenbank, Colin: *See—*
McNulty, Patrick J.; Swithenbank, Colin; Viste, Kenneth L.; and Von Meyer, William C., 3,819,355.

Sydney Steel Corporation: *See—*
Wells, William; and Haysom, Derek W. R., 3,819,164.

Sykora, Hans Werner, to Coleman Company, Inc., The. Attachment assembly for snowmobile windshield. 3,819,226, Cl. 296-90.000.

Sylvester, Herbert A., to Carreras Limited. Apparatus for the manufacture of paper filters. 3,818,809, Cl. 93-1.00c.

Syntex (U.S.A.) Inc.: *See—*
Crabbe, Pierre; Edwards, John A.; and Fried, John H., 3,819,686.

Syntex Corporation: *See—*
Pfister, Jurg R.; Harrison, Ian T.; and Fried, John H., 3,819,654.

Systron Donmer Corporation: *See—*
Farrer, Leland M., 3,820,039.

Szuch, Joseph: *See—*
Koerner, Frances; and Szuch, Joseph, 3,819,049.

Tabata, Hisanobu; Tabata, Norimasa; and Nakajima, Rokuro; deceased (by Nakajima, Tama; heir). Method of preparing magnesium hydroxide. 3,819,803, Cl. 423-160.000.

Tabata, Norimasa: *See—*
Tabata, Hisanobu; Tabata, Norimasa; and Nakajima, Rokuro, 3,819,803.

Tabe, Norihiko: *See—*
Ono, Katsuya; Fujiwara, Motozo; Tabe, Norihiko; and Kawahito, Norihiko, 3,819,792.

Taboultier, Paul J.; and Abgrall, Rene J., to Etat Francais represente par le Ministre d'Etat Charge de la Defense Nationale Delegation Ministerielle pour l'Armement Direction Technique des Constructions Navales. Stop members in ships. 3,818,853, Cl. 114-10.000.

Tachimori, Hironori; Nagahori, Teiji; and Nakamura, Yukio, to Mitsui Mining & Smelting Co. Ltd. and Max-Coater Co., Ltd. Hot-dip lead coating. 3,819,406, Cl. 117-114.00r.

Tacke, William H.; Ormiston, Robert B.; and McCrackin, Lonnie L., to Steelcase Inc. Base for cabinet or the like. 3,819,245, Cl. 312-253.000.

Taft, Philip, to Girling Limited. Control valves for vehicles. 3,818,944, Cl. 137-627.500.

Taggart, Campbell, Inc.: *See—*
Keith, Billy M.; Bussey, James R.; Cannon, Sidney E.; Patton, James C.; Fisher, Perry G.; Caldwell, Joseph H.; and Crocker, Ralph H., Jr., 3,819,837.

Taguchi, Tatsuya; and Iura, Yukio, to Canon Kabushiki Kaisha. Antimisfunction device for a single lens relfex camera. 3,820,124, Cl. 354-23.000.

Tague, Robert J. Visual guide means for ball and socket alignment during an automotive trailer coupling operation. 3,818,599, Cl. 33-264.000.

Tahiliani, Vasu H., to I-T-E Imperial Corporation. Termination for metal enclosed, compressed gas insulated electrical conductor. 3,819,845, Cl. 174-11.00r.

Taiheiyo Coal Mining Co., Ltd.: *See—*
Nakajima, Shigeo, 3,819,031.

Taiseikensetsu Kabushiki Kaisha: *See—*
Yasima, Teturo; Morisawa, Takao; Tazawa, Eiichi; and Tsuruta, Yasuhiko, 3,819,565.

Tait, John B.: *See—*
Krewson, Neil N.; and Tait, John B., 3,820,069.

Takagi, Nobuo; Kubo, Takeshi; and Takiguchi, Takashi, to Kabushiki Kaisha Toyoda Jidoshikki Seisakusho. Method for rotary bi-axle type friction welding. 3,819,339, Cl. 29-470.300.

Takago, Toshio; Sato, Tamio; and Aoki, Hisashi, to Shinetsu Chemical Company. Room temperature vulcanizing organopolysiloxane compositions. 3,819,563, Cl. 260-37.0sb.

Takahashi, Hideyuki: *See—*
Sato, Yuji; and Takahashi, Hideyuki, 3,819,736.

Takahashi, Saburo; Oyama, Hiroshi; Naka, Hiroshi; Yamamoto, Takaji; Nakatomi, Kentaro; Ishibe, Kouichi; and Saito, Toshihiro, to Hokko Chemical Industry Co., Ltd. Formamidine derivatives and the composition containing same. 3,819,701, Cl. 260-564.0rf.

Takano, Tadayoshi; Kurita, Masaru; Nikaido, Hiroo; Mera, Masashi; Konishi, Nobukiyo; and Okui, Ritsuko, to Fujisawa Pharmaceutical Co., Ltd. 3,7-Disubstituted cephalosporin compounds. 3,819,623, Cl. 260-243.00c.

Takaoka, Saburo: *See—*
Saeki, Yoshifumi; and Takaoka, Saburo, 3,819,957.

Takasawa, Seigo: *See—*
Nara, Takashi; Takasawa, Seigo; Okachi, Ryo; Kawamoto, Isao; Kumakawa, Masaru; Yamamoto, Mitsuyoshi; and Sato, Seiji, 3,819,485.

Takeda Chemical Industries, Ltd.: *See—*
Hasegawa, Toru; Henmi, Teruji; Kamiya, Takaaki; and Iwasaki, Hidesuke, 3,819,835.
Horii, Satoshi; Mizokami, Nariakira; Fujino, Masahiko; Shinagawa, Susumu; Ochiai, Michihiko; and Okutani, Tetsuya, 3,819,619.
Imai, Kin-Ichi; and Honjo, Mikio, 3,819,612.
Marumoto, Ryuji; Yoshioka, Yoshio; Kawazoe, Katsuyoshi; and Honjo, Mikio, 3,819,613.
Meguro, Kanji; Miyano, Hiroshi; Kuwada, Yutaka; Henmi, Teruji; and Yamano, Togo, 3,819,634.

Takeda, Yasutsugu; Oshida, Yoshitada; and Imagawa, Fumio. Multiple exposure holographic apparatus in which phase relationship is randomly changed with each exposure. 3,819,248, Cl. 350-3.500.

Takemura, Toshisada: *See—*
Tokumitsu, Ichiro; Takemura, Toshisada; Sugiyama, Minoru; Nishiyama, Kenji; Ogawa, Shigeo; and Okiyama, Sadao, 3,818,975.

Takenaka, George: *See—*
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Takeuchi, Hiromoto: *See—*
Kondo, Kaneichi; Ishii, Akira; and Takeuchi, Hiromoto, 3,819,963.

Takeuchi, Shigeo, to Takeuchi Tekko Kabushiki Kaisha. Brush supporting device for a car washer. 3,818,530, Cl. 15-21.00d.

Takeuchi Tekko Kabushiki Kaisha: *See—*
Takeuchi, Shigeo, 3,818,530.

Takiguchi, Takashi: *See—*
Takagi, Nobuo; Kubo, Takeshi; and Takiguchi, Takashi, 3,819,339.

Tamm, Rolf Gunter Arnold: *See—*
Braun, Klaus Joachim; Manthey, Kurt; Rogasch, Klaus-Peter; and Tamm, Rolf Gunter Arnold, 3,819,279.

Tamny, Simon Z.: *See—*
Crum, Gerald W.; Reighard, Allan B.; and Tamny, Simon Z., 3,818,930.

Tanabe Seiyaku Co., Ltd.: *See—*
Ishida, Nakao; and Okuda, Tomoharu, 3,819,833.

Tanaka, Harumi, to Minolta Camera Kabushiki Kaisha. Electronic shutter for camera. 3,820,131, Cl. 354-38.000.

Tanaka, Teruaki: *See—*
Kunii, Takao; Tanaka, Teruaki; Kanaya, Sadaaki; and Nagayama, Shuichi, 3,819,975.

Tanenholtz, Stanley D.: *See—*
Barron, Edward R.; and Tanenholtz, Stanley D., 3,818,756.

Tappeiner, Hermann; Waldmann, Hermann; and Bayer, Karl-Heinz, to Siemens Aktiengesellschaft. Method of controlling a pulse inverter for an induction. 3,820,003, Cl. 321-5.000.

Tarnow, Horst; Sasse, Klaus; Homeyer, Bernhard; and Wolfgang, Behrenz, to Bayer Aktiengesellschaft. O,O-Dialkyl-O-(4-trifluoromethylphenyl)-thionophosphoric acid esters. 3,819,755, Cl. 260-955.000.

Tassell, Leslie E.: *See—*
Smit, Henry, 3,818,748.

Tassone, Joseph V.: *See—*
Candor, James T.; and Tassone, Joseph V., 3,819,038.

Tatano, Toshio: *See—*
Shimizu, Yoshiaki; Akiyama, Yoshiyuki; and Tatano, Toshio, 3,819,481.

Tatsuguchi, Isamu: *See—*
Gewartowski, James Walter; and Tatsuguchi, Isamu, 3,820,041.

Taylor, Alwyn H.; Giner, Jose; and Goebel, Franz, to Tyco Laboratories, Inc. Plates for lead acid batteries. 3,819,412, Cl. 136-10.000.

Taylor, Charles W.; and Chang, Robert W. H., to Minnesota Mining and Manufacturing Company. Non-leachable U.V. absorber and dental restorative material. 3,819,568, Cl. 260-42.520.

Taylor, Dale F., to General Electric Company. Storage battery and positive electrode therefor. 3,819,414, Cl. 136-26.000.

Taylor, Donald O.: *See—*
Nittinger, Russell H.; and Taylor, Donald O., 3,819,168.

Taylor, Lloyd D.: *See—*
Sahatjian, Ronald A.; and Taylor, Lloyd D., 3,819,371.

Taylor, Robert S., to Hexcel Corporation. Method of making honeycomb of sinterable material employing stepwise coating of a resin-containing composition. 3,819,439, Cl. 156-89.000.

Tazawa, Eiichi: *See—*
Yasima, Teturo; Morisawa, Takao; Tazawa, Eiichi; and Tsuruta, Yasuhiko, 3,819,565.

Tazuma, James J.: *See—*
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Teche, Andre: *See—*
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Technicon Instruments Corporation: *See—*
Rush, Robert L.; Leon, Luis P.; and De Lea, Anne C., 3,819,488.

**Ted-Bildplatten Aktiengesellschaft Aeg-Telefunken-Teldec:** *See—*
Borchard, Heinz; Kasch, Robert; and Rybka, Bruno, 3,819,315.
**Tedrick, Ruth E.:** *See—*
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**Tee-Pak, Inc.:** *See—*
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**Teijin Limited:** *See—*
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Shima, Takeo; Kobayashi, Takayuki; Kawase, Shoji; and Kurisu, Shizuka, 3,819,584.
Shimauchi, Shiro; Minemura, Norihiro; Matsui, Takesha; Ito, Kenji; Shima, Takeo; and Oshima, Masataka, 3,819,326.
Yamashita, Gentaro; Fujii, Takeshi; and Sakota, Koichiro, 3,819,695.
**Teitel, Sidney:** *See—*
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**Tektronix, Inc.:** *See—*
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**Telecommunications Radioelectriques et Telephoniques T.R.T.:** *See—*
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**Teledyne Mid-America Company:** *See—*
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**Telefonaktiebolaget L M Ericsson:** *See—*
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**Telefonaktiebolaget LM Ericsson:** *See—*
Carlsson, Eric Ake Ragnar; Dahlsjo, Olof Gustav Robert; Karlsson, Goran Roland; and Pettersson, Kent Morgan, 3,820,116.
**Telex Communications, Inc., mesne:** *See—*
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**Tenco Hydro/Aerosciences, Inc.:** *See—*
Matschke, Donald E.; Tenny, Alfred M.; and Gregersen, Jack K., 3,819,799.
**Teng, James;** and Stubits, Marcella C., to Anheuser-Busch, Incorporated. Lipophilic cellulose sponges. 3,819,390, Cl. 106-122.000.
**Tenny, Alfred M.:** *See—*
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**Tension Structures, Inc.:** *See—*
Moss, Charles W., 3,818,669.
**Teot, Arthur S.:** *See—*
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**Terada, Kazuji:** *See—*
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**Teranishi, Nobuyuki:** *See—*
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**Terashima, Yoshimi:** *See—*
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**Terhune, Hugh D., to Goodyear Tire & Rubber Company, The,** mesne. Power transmission belt and method of making. 3,818,741, Cl. 74-23.300.
**Tescom Corporation:** *See—*
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**Texaco Inc.:** *See—*
Canup, Robert E., 3,818,885.
Christopher, Charles A., Jr.; and Satter, Abdus, 3,818,989.
Kablaoui, Mahmoud S.; and Lachowicz, Donald R., 3,819,570.
Knifton, John F., 3,819,669.
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**Texas Instruments, Incorporated:** *See—*
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**Textron, Inc.:** *See—*
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**Thermo-Kinetics, Inc.:** *See—*
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**Theurer, Josef:** *See—*
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**Thevenaz, Jean;** Etter, Walter; and Thevenaz, Louis, to Bolex International S.A. Device for taking up the end of a wound tape. 3,819,129, Cl. 242-192.000.
**Thevenaz, Louis:** *See—*
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**Thexton, Graham Spencer:** *See—*
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**Thiel, Herbert Willy:** *See—*
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**Thiokol Chemical Corporation:** *See—*
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**Thirion, Pierre:** *See—*
Brun, Jean-Pierre; Bulvestre, Gerard; Juillou, Michel; Thirion, Pierre; and Pautrat, Rene, 3,819,742.
**Thomas, Alfred William, to Deutsche Bendix Austustungs GmbH.** Power boost device. 3,818,705, Cl. 60-548.000.
**Thomas, Chester A., to Babson Bros. Co. Milker.** 3,818,866, Cl. 119-14.100.
**Thomas, James Allan:** *See—*
Thomas, Wesley L.; and Thomas, James Allan, 3,819,924.
**Thomas, James L.** Digital tone signal generator. 3,820,028, Cl. 328-14.000.
**Thomas, Robert:** *See—*
Hadni, Armand; and Thomas, Robert, 3,820,088.
**Thomas, Wesley L.;** and Thomas, James Allan. Lamp. 3,819,924, Cl. 240-2.0sl.
**Thompson, Wayne E.;** and Pohland, Albert, to Lilly, Eli, and Company. Resolution of DL-camphor-10-sulfonic acid. 3,819,689, Cl. 260-503.000.
**Thompson, William Arthur, to Air Logic Pty. Limited.** Control devices. 3,819,909, Cl. 235-61.11r.
**Thomson-CSF:** *See—*
Ponnet, Robert; and Thomson-CSF, 3,819,341.
**Thorel, John P.;** and McEdwards, James A., to Rockwell International Corporation. Top shield sealing system of a nuclear reactor. 3,819,478, Cl. 116-87.000.
**Thorn Electrical Industires, Limited:** *See—*
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**Thornton, Michael Joseph:** *See—*
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**Thrall Car Manufacturing Company:** *See—*
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**Throndson, Lester W., to Rockwell International Corporation.** Aircraft system lift ejector. 3,819,134, Cl. 244-42.0cc.
**Throner, Guy C., Jr., to FMC Corporation.** Independent multiple head forward firing system. 3,818,833, Cl. 102-7.200.
**Thrower, Herbert T., Jr., to Hystron Fibers Incorporated.** Process for heat setting crimped synthetic polymeric fiber tow. 3,819,402, Cl. 93-1.0dh.
**Thumm, J. Randall; Roberson, Cletis L.;** and Klink, Jerome P., to Owens-Corning Fiberglas Corporation. Method and apparatus producing perturbations while winding glass fibers. 3,819,344, Cl. 65-2.000.
**Thunus, Leopold Nicolas Joseph Victor:** *See—*
Delarge, Jacques E.; Thunus, Leopold Nicolas Joseph Victor; Lapiere, Charles-Leon Albert; and Georges, Andre Henri Eugene, 3,819,639.
**Thurn, Robert Dean:** *See—*
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**Thuron Industries, Inc.:** *See—*
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**Tiberg, Magnus Gustav Georg, to SKF Industrial Trading and Development Company N.V.** Method of slag separation. 3,819,361, Cl. 75-13.000.
**Tigner, Ruben A.;** and Mounts, Lewis S., to Dow Chemical Company, The. Apparatus for repeated tracing various patterns. 3,818,769, Cl. 74-55.000.
**Tilly, Guy, to Laboratoires Andre Guerbet.** X-ray opacifiers. 3,819,821, Cl. 424-5.000.
**Timex Corporation:** *See—*
Schwarzschild, Gunter J., 3,818,690.
**Timmons, Frank E.:** *See—*
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**Timtner, Karlheinz, to Ringspann Albrecht Maurer KG.** Sprag for freewheeling clutch. 3,819,019, Cl. 192-41.00a.
**Toivonen, Matti; Kettunen, Kyrki;** and Salunen, Eero, to Savon Sellu Oy. Process for the recovery of $NH_3$, $SO_2$, volatile organic acids and furfural from concentrated waste liquor. 3,819,812, Cl. 423-358.000.
**Tokumitsu, Ichiro; Takemura, Toshisada; Sugiyama, Minoru; Nishiyama, Kenji; Ogawa, Shigeo;** and Okiyama, Sadao, to Idemitsu Petrochemical Co., Ltd. and Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Method of removing carbonaceous matter from heat exchange tbes. 3,818,975, Cl. 165-1.000.
**Tokyo Ohka Kogyo Co., Ltd.:** *See—*
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**Tokyo Shibaura Electric Co., Ltd.:** *See—*
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**Toman, Donald J., to Tull Aviation Corporation.** Remote operating condition data acquisition system. 3,820,074, Cl. 340-151.000.
**Tomizawa, Michishige;** and Akizuki, Hirobumi, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Vessel unloader. 3,819,065, Cl. 214-14.000.

Tomlinson, Richard G., to United States of America, Atomic Energy Commission, mesne. Method and apparatus for producing isolated laser pulses having a fast rise time. 3,820,038, Cl. 331-94.50q.

Tommasini, Raffaele: *See—*
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Toyo Seikan Kaisha, Limited: *See—*
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Toyonage, Ryuya; and Hiruma, Eikyu, to Nippon Hoso Kyokai. Method for manufacturing vapor deposited electrode. 3,819,408, Cl. 117-201.000.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
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trange-Hansen, Poul. Teat cup. 3,818,867, Cl. 119-14.470.

Transaction Technology Inc.: *See—*
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Transco Inc.: *See—*
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Transfer Systems Incorporated: *See—*
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Tria, Leonard F., Jr.; and Wiacek, Edward A. Cylinder lock construction. 3,818,732, Cl. 70-359.000.

Tria, Peter. Safety switch assembly for a relief valve. 3,818,874, Cl. 122-504.000.

Trieschmann, Hans-Georg: *See—*
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Trostler, Richard M. Heater control system. 3,819,905, Cl. 219-501 000.

Troy Mills, Inc.: *See—*
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Trubisky, Michael P., to Xerox Corporation. Surface deformable imaging member of improved dark decay characteristics. 3,819,369, Cl. 96-1.500.

Truitt, Rolland D. Aircraft collision avoidance system. 3,820,064, Cl. 340-25.000.

Truskalo, Walter, to Philco-Ford Corporation. High voltage regulators. 3,819,979, Cl. 315-29.000.

TRW Inc.: *See—*
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Tyler, Hugh Jean; Wolfe, Denis G.; and Mitts, Richard K., to Robertshaw Controls Company. Thermal switch. 3,820,050, Cl. 337-408.000.

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Ucciardino, Angelo. Mailbox array. 3,819,109, Cl. 232-24.000.

Uchikawa, Hiroshi; and Kasai, Noboru, to Onoda Cement Co., Ltd. Process for manufacturing a rapid hardening portland cement. 3,819,389, Cl. 106-100.000.

Uchiyama, Hideaki, to Kabushiki Kaisha Suwa Seikosha. Solar cell for timepiece. 3,818,691, Cl. 58-23.00c.

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UMC Industries, Inc.: *See—*
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Umezawa, Sumio; Machida, Isamu; Shiotsu, Susumu; Yokota, Kimio; Makino, Shigehide; Kawaguchi, Gaku; and Honda, Kazutoshi, to Meji Seika Kaisha, Ltd., mesne. Espinomycin antibiotics and methods of preparing same. 3,819,834, Cl. 424-120.000.

Unema, Norman P.; and Stapert, James, Jr., to Laser Alignment, Inc. Light target and sensor. 3,819,273, Cl. 356-152.000.

Ungerer, Aaron J. Weather strip and method of making. 3,819,444, Cl. 156-250.000.

Ungerer, Aaron J., to Standard Products Co., The. Weather strip and method of making. 3,819,464, Cl. 161-64.000.

Union Carbide Corporation: *See—*
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Upham, Robert Warren, to Clark Equipment Company. Gear tooth chamfering. 3,818,795, Cl. 90-1.400.
Uppal, Sohan L., to Eaton Corporation. Stability means for a controller for fluid pressure operated devices. 3,819,307, Cl. 418-61.00b.
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Valatka, Daniel E.; and Fairbanks, Bernard, to United States of America, Army. Self-destruct fuze with electrostatic switch. 3,818,835, Cl. 102-70.20r.
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van Esdonk, Johannes; and Poolman, Petrus Jacobus, to U.S. Philips Corporation. Measuring cell for determining oxygen concentrations in a gas mixture. 3,819,500, Cl. 204-195.00s.
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Van Riemsdijk, Gerardus Andriaan, to Smit Nijmegen Electrotechnische Fabrieken N.V. Driving mechanisms having multiple maltese driving gear. 3,818,747, Cl. 74-436.000.
Van Roosmalen, Johannes Hendricus: *See—*
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Van Venrooy, John J.: *See—*
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Vasta, Joseph A., to Du Pont de Nemours E. I., and Company. Coating composition of an aromatic polysulfone resin and epoxy resin, and n-cychlohexyl toluene sulfonamide. 3,819,472, Cl. 161-185.000.
Vause, Arthur Samuel, to Thorn Electrical Industires, Limited. Method of making lamp cap connections using superplastic alloy. 3,818,558, Cl. 29-25.130.
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Venema, Harry J., to Borg-Warner Corporation. Breath testing system with increased sensitivity. 3,818,899, Cl. 128-2.00c.
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Vincent, David N.; and Chang, Cheng Hsiung, to Champion International Corporation. Dilactone chromogenic compounds, preparation thereof, and pressure-sensitive copy systems employing same. 3,819,396, Cl. 117-36.200.

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Vivier, Albert F., to Etat Francais - Delegation Ministerielle pour l'Armemen. Apparatus for quickly opening, damping, holding open, and closing a hinged closure member. 3,818,637, Cl. 49-379.000.

Vlinsky, Milton: *See*—
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Vogel, Eberhard, to Bosch, Robert, G.m.b.H. Power unit for tools. 3,818,722, Cl. 64-30.00e.

Vogt, Kenneth S., to General Motors Corporation. Voltage detector. 3,820,099, Cl. 340-248.00a.

Vogt, Wilhelm; and Glaser, Hermann, to Knapsack Aktiengesellschaft. Production of methacrolein. 3,819,715, Cl. 260-601.00r.

Voith Getriebe KG: *See*—
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Von Bebenburg, Walter; and Posselt, Klaus, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Pyrazolyl-phenylalkylaminoketones. 3,819,617, Cl. 260-240.00k.

Von Bebenburg, Walter, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Aza-benzimidazoles and process for their production. 3,819,640, Cl. 260-294.80c.

Von Kohorn, Henry. System for removing snow and ice from and for subsequently drying an athletic playing surface. 3,818,892, Cl. 126-271.100.

Von Konig, Anita; Kampfer, Helmut; Roos, Ernst; and Ley, Kurt, to Agfa-Gevaert Aktiengesellschaft. Light-sensitive material having developers embedded therein. 3,819,382, Cl. 96-114.100.

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York, Buddy L.; and Terada, Kazuji, to Dow Chemical Company. Separation of macrocrystalline non-solvated aluminum hydride. 3,819,337, Cl. 423-130.000.

Yoshida, Yoshinaga; Kobayashi, Shigehiko; Miyazaki, Kazuhide; Yamamoto, Michiaki; and Seki, Yasuo, to Mitsui Mining & Smelting Co., Ltd. Catalytic reaction apparatus for purifying waste gases containing carbon monoxide. 3,819,334, Cl. 23-288.00f.

Yoshimura, Yoshio; Hosoki, Kanoo; Kurooka, Shigeru; and Iwamura, Kenichiro, to Dainippon Pharmaceutical Co., Ltd. Method for treating diseases by coenzyme A and adenosine triphosphate and composition therefor. 3,819,830, Cl. 424-94.000.

Yoshinaga, Fumihiro; Tsuchida, Takayasu; and Okumura, Shinji, to Ajinomoto Co., Inc. Method of producing L-proline by fermentation. 3,819,483, Cl. 195-.290.

Yoshioka, Yoshio: *See—*
Marumoto, Ryuji; Yoshioka, Yoshio; Kawazoe, Katsuyoshi; and Honjo, Mikio, 3,819,613.

Young, Donald C., to Union Oil Company of California. Pineapple treatment. 3,819,359, Cl. 71-127.000.

Young, Gregory G.: *See—*
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Young, Gregory G.; and Eifert, Melvin C., to Young, Gregory G. Apparatus for conducting programmed psychotherapy. 3,818,611, Cl. 35-9.00f.

Young, John W.: *See—*
Huber, Richard O.; Higbee, David A.; and Young, John W., 3,819,145.

Yu, Pyung Kyung: *See—*
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Zaruba, Karl, to General Motors Corporation. Improved cylinder head cooling. 3,818,878, Cl. 123-41.820.

Zaugg, Harold Elmer, to Abbott Laboratories. Oxazoles and their use as herbicides. 3,819,356, Cl. 71-88.000.

Zaugg, Roland; Schaller, Kurt; and Bron, Alphonse, to Schild, A., S.A. Drive mechanism for two coaxial calendar members in watch movement. 3,818,692, Cl. 58-58.000.

Zehnder, Josef: *See—*
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Zeiger, Robert J.; and Gerdts, John C., to United States of America, National Aeronautics and Space Administration. Concentric differential gearing arrangement. 3,818,775, Cl. 74-675.000.

Zelinski, Paul A.: *See—*
Jones, Leo V.; Keehn, Paul J.; and Zelinski, Paul A., 3,820,084.

Zelinski, Paul A., to GTE Automatic Electric Laboratories, Incorporated. Communication switching system having separate register subsystem and stored program processor each having its own memory, and data transfer by processor access to the register memory 3,820,085, Cl. 340-172.500.

Zellers, James T.: *See*—
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Zenkosha Tokie Kabushiki Kaisha: *See*—
Moroto, Kaoru; and Suzuki, Isao, 3,819,885.

Zettler, William D., to Giddings & Lewis, Inc. Drawbolt for machine tool spindles. 3,818,797, Cl. 90-11.00d.

Zeuner, Kenneth W., to Control Concepts, Inc. Normally open solenoid operated valve assembly with relief function. 3,818,927, Cl. 137-110.000.

Zickos, William. Interchangeable drum resonators and generators. 3,818,791, Cl. 84-411.000.

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Zitzmann, Fritz, to Max-Planck-Gesellschaft zur Forderung der. Centrifugal pump for corrosive liquids. 3,819,293, Cl. 415-200.000.

Zmoda, Barney J.; and Brown, Raymond S., to Colgate-Palmolive Company. Anti-fogging window cleaner surfactant mixture. 3,819,522, Cl. 252-89.000.

Zoecon Corporation: *See*—
Siddall, John B.; and Calame, Jean Pierre, 3,819,667.

Zoethout, Waltherus Andreas: *See*—
Heier, Jan; and Zoethout, Waltherus Andreas, 3,819,340.

Zook, Donald G.: *See*—
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Zumach, Gerhard; Siegle, Peter; Hammann, Ingeborg; and Frohberger, Paul-Ernst, to Bayer Aktiengesellschaft. N-Methyl N-sulfenylated oxime carbamates. 3,819,649, Cl. 260-327.00m.

Zumach, Gerhard; Kuhle, Engelbert; Behrenz, Wolfgang; and Hammann, Ingeborg, to Bayer Aktiengesellschaft. Sulfenylated cycloalkyphenyl-N-methylcarbamates. 3,819,682, Cl. 260-479.00c.

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Canadian Johns-Manville Corporation, Ltd. : *See*—
Hodsman, James B. Re. 28,053.

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Weissberger, Arnold, and Kibler. Re. 28,055.

Erwin, Henry P., Jr. Coil set for automobile starter motors. Re. 28,052, 6–25–74, Cl. 290—38.

Hodsman, James B., to Canadian Johns-Manville Corp., Ltd. Material securing and transporting apparatus. Re. 28,053, 6–25–74, Cl. 38—102.

Kibler, Charles J. : *See*—
Weissberger, Arnold, and Kibler. Re. 28,055.

Stero N.V. : *See*—
Stevens, Simon E. Re. 28,056.

Stevens, Simon E., to Stero N.V. Stretcher. Re. 28,056, 6–25–74, Cl. 5—81.

Weissberger, Arnold, and C. J. Kibler, to Eastman Kodak Co. Acetoacetamide couplers in which the non-oxo carbon atom of the aceto group is a tertiary carbon atom. Re. 28,055, 6–25–74, Cl. 260—507.

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Ball, Geo. J., Inc. : *See*—
Yuge, Takeo. 3,577.
Yuge, Takeo. 3,580.

Campbell, Fred J., to Hilltop Orchards & Nurseries, Inc. Red chief. 3,578, 6–25–74, Cl. 35.

Duffett, William E. : *See*—
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Jessel, Walter H., Jr., and W. E. Duffett, to Yoder Brothers, Inc. Chrysanthemum plant. 3,576, 6–25–74, Cl. 74.

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Yuge, Takeo, to Geo. J. Ball, Inc. Azalea plant. 3,580, 6–25–74, Cl. 55.

# LIST OF DESIGN PATENTEES

Allington, William W. Hand-held combined caution flag and blinking warning light for school children crossings. 231,908, 6–25–74, Cl. D10—114.

Allington, William W. Combined hand-held warning sign and blinking light and battery case therefor. 231,909, 6–25–74, Cl. D10—114.

American Optical Corp. : *See*—
Loughner, Larry G. 231,948.

Amerock Corp. : *See*—
Tegner, Raymond U. H. 231,897.

Andrew, Lyman R., to Viking Universal Corp. Fireplace. 231,933, 6–25–74, Cl. D23—97.

Andrus, Edward R., Jr., D. E. Fahnstrom, and J. G. Hansen, to Elder Wilbert Corp. Casket. 231,937, 6–25–74, Cl. D31—3.

Appleton, Samuel A. Masonry block. 231,926, 6–25–74, Cl. D18—2.

Baker, Joseph M. Novelty cart. 231,911, 6–25–74, Cl. D12—1.

Bates Mfg. Co., The : *See*—
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Beger, Richard E., to The Bates Mfg. Co. Telephone index. 231,953, 6–25–74, Cl. D74—1.

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Bentley, Maxwell, to Delsemme's Artist Materials. Bracket for picture frame. 231,901, 6–25–74, Cl. D8—258.

Berman, Charles H. Combined bottle and display carton therefor. 231,903, 6–25–74, Cl. D9—12.

Bloch, Jack, to Foster Grant Co., Inc. Spectacle front. 231,950, 6–25–74, Cl. D57—1.

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Boden, Joseph, to Boden Products, Inc. Bottle. 231,904, 6–25–74, Cl. D9—44.

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British and International Proprietaries Ltd. : *See*—
Greif, Francis. 231,954.

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Bruhn, Larry C. Bumper attachment for vehicles. 231,919, 6–25–74, Cl. D12—167.

Burchette, Robert L., Jr. Yarn dye tube. 231,941, 6–25–74, Cl. D47—5.

Caldwell, John W. Table frame. 231,888, 6–25–74, Cl. D6—192.

California R & D Center : *See*—
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Cincotta, Donald J., and H. J. Kopelke. Cordless illumination unit. 231,942, 6–25–74, Cl. D48—4.

Coe, Dane B., to Innova Inc. Toy training doll. 231,940, 6–25–74, Cl. D34—4.

Cole, John D. Building roof. 231,922, 6–25–74, Cl. D13—1.

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Cooper, Dale E. Combined boat and trailer. 231,912, 6–25–74, Cl. D12—2.

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Hansen, James G. : *See*—
Andrus, Edward R., Jr., Fahnstrom, and Hansen. 231,937.

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Hewson, Kenneth E. Door bracket. 231,899, 6–25–74, Cl. D8—233.

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Keller, Huey T. Dresser or the like. 231,884, 6–25–74, Cl. D6—164.
Kellum, Thomas B. Mobile lounge chair. 231,878, 6–25–74, Cl. D6—39.
Kephart, Lynn H. Table. 231,885, 6–25–74, Cl. D6—175.
Kephart, Lynn H. Table. 231,886, 6–25–74, Cl. D6—175.
Kephart, Lynn H. Table. 231,887, 6–25–74, Cl. D6—175.
King, Donald G. Combined bench and container module. 231,873, 6–25–74, Cl. D6—4.
Knight, Arden M. Carpet cleaner unit. 231,894, 6–25–74, Cl. D7—167.
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Krieger, John F., and R. S. Block, to Breakthru Inc. Feed bowl tray. 231,889, 6–25–74, Cl. D7—37.
Kritkausky, Robert E., to K & S Corp. Combined skewer set and cutting board. 231,890, 6–24–74, Cl. D7—46.
Kullenback, Jan G. Toilet accessory for home pets. 231,936, 6–25–74, Cl. D3—99.
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Rehrig, Houston, and B. E. Sanders, to Rehrig Pacific Co. Milk crate or the like. 231,905, 6–25–74, Cl. D9—177.
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Rutili, Renzo N., to Owatonna Tool Co. Automotive choke tester or similar article. 231,943, 6–25–74, Cl. D52—6.
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Saxen, Erik, to Oy Takuuvalmiste Ab. Center plug for a paper roll core. 231,898, 6–25–74, Cl. D8—220.
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Spaulding, Frederick W. Orthodontic tooth brush. 231,872, 6–25–74, Cl. D4—25.
Speigel, F. Williams, Jr. Fishing rod holder. 231,925, 6–25–74, Cl. D22—22.
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13.4 3,818,601
14 3,818,602
45 3,818,603
3,818,604
57A 3,818,605
3,818,606
99 3,818,600
115 3,818,607

**CLASS 35**

8A 3,818,608
8R 3,818,609
9C 3,818,610
9F 3,818,611
12K 3,818,613
12N 3,818,612
19R 3,818,614
37 3,818,615
74 3,818,616

**CLASS 36**

32R 3,818,617

**CLASS 37**

8 3,818,618
104 3,818,619

**CLASS 38**

102.1 Re.28,053
102.2 3,818,620

**CLASS 40**

2R 3,818,621
104.01 3,818,622
324 3,818,623

**CLASS 43**

27.4 3,818,625
42.04 3,818,626
43.13 3,818,624

**CLASS 44**

7.5 3,819,342

**CLASS 46**

7 3,818,627
42 3,818,628
53 3,818,629
131 3,818,630
161 3,818,631
243LV 3,818,632

**CLASS 47**

1.2 3,818,633
34.13 3,818,634

**CLASS 49**

2 3,818,635
224 3,818,636
379 3,818,637

**CLASS 51**

5 3,818,638
112 3,818,639
114 3,818,640
125.5 3,818,641
165.8 3,818,642
3,818,643
168 3,818,644
3,818,645
217R 3,818,646
218R 3,818,647
268 3,818,648
302 3,819,343
323 3,818,649
326 3,818,650
368 3,818,651

**CLASS 52**

23 3,818,652
79 3,818,653
3,818,654
3,818,655
100 3,818,656
115 3,818,657
169 3,818,658
220 3,818,659
251 3,818,660
282 3,818,661
285 3,818,662
300 3,818,663
309 3,818,664
375 3,818,665
403 3,818,666
473 3,818,667
547 3,818,668
582 3,818,669
624 3,818,670
638 3,818,671
758H 3,818,672

**CLASS 53**

24 3,818,673
124C 3,818,674
133 3,818,675
173 3,818,676
338 3,818,677

**CLASS 55**

13 3,818,678
16 3,818,679
48 3,818,680
90 3,818,681
106 3,818,682
223 3,818,683

**CLASS 56**

11.1 3,818,686
13.3 3,818,684
98 3,818,685
320.2 3,818,687
400.01 3,818,688

**CLASS 58**

5 3,818,689
23C 3,818,691
23D 3,818,690
58 3,818,692
130E 3,818,693

**CLASS 59**

29 3,818,694

**CLASS 60**

39.16C 3,818,695
39.51H 3,818,696
94A 3,818,697
3,818,698
203 3,818,700
277 3,818,701
290 3,818,702
504 3,818,703
548 3,818,704
562 3,818,705
665 3,818,706
685 3,818,699
3,818,707

**CLASS 61**

1F 3,818,708
41A 3,818,709
45R 3,818,710
50 3,818,711
3,818,712
85 3,818,713

**CLASS 62**

11 3,818,714
45 3,818,715
178 3,818,716
217 3,818,717
272 3,818,718
374 3,818,719
514 3,818,720

**CLASS 64**

21 3,818,721
30E 3,818,722

**CLASS 65**

2 3,819,344
6 3,819,345
24 3,819,346
29 3,819,347
36 3,819,348
63 3,819,349
134 3,819,350
273 3,819,351
357 3,819,352

**CLASS 66**

50B 3,818,723
50R 3,818,724
62 3,818,725
75 3,818,726
127 3,818,727
154A 3,818,728

**CLASS 68**

23.7 3,818,729

**CLASS 69**

30 3,818,730

**CLASS 70**

232 3,818,731
359 3,818,732

**CLASS 71**

76 3,819,353
3,819,358
78 3,819,354
88 3,819,355
3,819,356
90 3,819,357
127 3,819,359

**CLASS 72**

41 3,818,733
75 3,818,734
78 3,818,735
88 3,818,736
134 3,818,737
149 3,818,738
163 3,818,739
203 3,818,740
238 3,818,742
243 3,818,743
250 3,818,744
270 3,818,745
356 3,818,746
448 3,818,748
469 3,818,749
476 3,818,750

**CLASS 73**

15.6 3,818,751
49.2 3,818,752
94 3,818,753
134 3,818,754
146 3,818,755
172 3,818,756
194A 3,818,757
204 3,818,758
290R 3,818,759
291 3,818,760
359 3,818,761
3,818,762
363.7 3,818,763
393 3,818,764
395 3,818,765
406 3,818,766

**CLASS 74**

5.5 3,818,767
6 3,818,768
55 3,818,769
57 3,818,770
99 3,818,771
107 3,818,772
112 3,818,773
125 3,818,774
233 3,818,741
364 3,818,776
410 3,818,777
421A 3,818,778
436 3,818,747
473R 3,818,779
501M 3,818,780
675 3,818,775
711 3,818,781
720.5 3,818,782
869 3,818,783

**CLASS 75**

3 3,819,360
13 3,819,361
76 3,819,362
118 3,819,363
122 3,819,364
130R 3,819,365
172R 3,819,366

**CLASS 81**

43 3,818,784

**CLASS 82**

70.2 3,818,786
101 3,818,785

**CLASS 83**

7 3,818,787
9 3,818,788
18 3,818,789
408 3,818,790

**CLASS 84**

1.1 3,819,843
1.26 3,819,844
379 3,818,792
411 3,818,791
454 3,818,793

**CLASS 89**

40A 3,818,794

**CLASS 90**

1.4 3,818,795
3 3,818,796
11D 3,818,797
13.05 3,818,798

**CLASS 91**

40 3,818,799
411B 3,818,801
411 3,818,800
443 3,818,802
499 3,818,803

**CLASS 92**

13.1 3,818,805
13.2 3,818,806
23 3,818,804
86.5 3,818,807
138 3,818,808

**CLASS 93**

1C 3,818,809
8WA 3,818,810
3,818,811
37R 3,818,812

**CLASS 96**

15D 3,819,367
1.5 3,819,368
3,819,369
3,819,370
3 3,819,371
4 3,819,372
23 3,819,373
29L 3,819,374
29R Re.28,054
35 3,819,375
45.2 3,819,376
48R 3,819,377
61M 3,819,378
68 3,819,379
76R 3,819,380
77 3,819,381
114.1 3,819,382
124 3,819,383

**CLASS 98**

33A 3,818,813
39 3,818,814
40D 3,818,815
43 3,818,816
115VM 3,818,817

**CLASS 99**

330 3,818,818
3,818,819
407 3,818,820
540 3,818,821
600 3,818,822

**CLASS 100**

93P 3,818,823
116 3,818,824
209 3,818,825

**CLASS 101**

45 3,818,826
184 3,818,827
269 3,818,828
3,818,829
350 3,818,830
375 3,818,831
401.1 3,818,832

**CLASS 102**

7.2 3,818,833
41 3,818,834
70.2R 3,818,835

**CLASS 104**

100 3,818,836
166 3,818,837
168 3,818,838
3,818,839
172S 3,818,840

**CLASS 105**

164 3,818,841
240 3,818,842
366R 3,818,843

**CLASS 106**

1 3,819,384
14 3,819,385
27 3,819,386
39.6 3,819,387
86 3,819,388
100 3,819,389
122 3,819,390
273R 3,819,391
287SE 3,819,392
314 3,819,393

**CLASS 108**

132 3,818,844

**CLASS 110**

8E 3,818,845
8R 3,818,846
3,818,847
18R 3,818,848

**CLASS 112**

130 3,818,851
219A 3,818,849

**CLASS 113**

120AA 3,818,850

**CLASS 114**

72 3,818,852
126 3,818,959
170 3,818,853
235R 3,818,854

**CLASS 115**

34R 3,818,855

**CLASS 116**

28R 3,818,856
132R 3,818,857
133 3,818,858

**CLASS 117**

6 3,819,394
8 3,819,395
36.1 3,819,397
36.2 3,819,396
36.7 3,819,398
49 3,819,399
54 3,819,400

93.1DH 3,819,402
105.4 3,819,403
106R 3,819,404
114R 3,819,406
138.RUA 3,819,405
138.8N 3,819,407
201 3,819,408
211 3,819,409
232 3,819,410
235 3,819,411

**CLASS 118**

24 3,818,859
202 3,818,860
221 3,818,861
306 3,818,862
323 3,818,863
637 3,818,864

**CLASS 119**

1 3,818,865
14.1 3,818,866
14.47 3,818,867
23 3,818,868

**CLASS 122**

5 3,818,869
7R 3,818,870
11 3,818,871
406S 3,818,872
494 3,818,873
504 3,818,874

**CLASS 123**

8.41 3,818,886
25E 3,818,875
25R 3,818,876
32EA 3,818,877
41.82 3,818,878
90.54 3,818,879
119A 3,818,880
119F 3,818,881
139AS 3,818,882
140R 3,818,883
142.5R 3,818,884
148 3,818,885

**CLASS 124**

15 3,818,887
35A 3,818,888

**CLASS 126**

19.5 3,818,889
200 3,818,890
202 3,818,891
271.1 3,818,892
360A 3,818,893

**CLASS 128**

1B 3,818,896
1R 3,818,894
2C 3,818,899
2F 3,818,895
3,818,897
2V 3,818,898
2.06R 3,818,900
2.08 3,818,901
6 3,818,902
56 3,818,904
77 3,818,905
136 3,818,906
172.2 3,818,907
173 3,818,908
232 3,818,909
3,818,910
269 3,818,911
285 3,818,912
305 3,818,913
349BV 3,818,903
396 3,818,914

**CLASS 131**

2 3,818,915

**CLASS 132**

85 3,818,916
116 3,818,917

**CLASS 133**

3H 3,818,918

**CLASS 135**

20R 3,818,919
36F 3,818,920

**CLASS 136**

10 3,819,412
25 3,819,413
26 3,819,414
83T 3,819,415
86R 3,819,416
89 3,819,417
205 3,819,418
213 3,819,419
228 3,819,420

**CLASS 137**

70 3,818,922
85 3,818,923
99 3,818,924
99.5 3,818,925
101 3,818,926
110 3,818,927
211.5 3,818,928
218 3,818,929
341 3,818,930
374 3,818,931
494 3,818,932
501 3,818,921
503 3,818,933
568 3,818,934
590 3,818,935
596.12 3,818,936
604 3,818,937
3,818,938
614.06 3,818,939
624.14 3,818,940
625.4 3,818,941
625.5 3,818,942
625.66 3,818,943
627.5 3,818,944

**CLASS 138**

89 3,818,945
96R 3,818,946
118.1 3,818,947
119 3,818,948
158 3,818,949
174 3,818,950

**CLASS 139**

20 3,818,951
127P 3,818,952
161R 3,818,953

**CLASS 140**

92.3 3,818,954

**CLASS 141**

12 3,818,955
316 3,818,956

**CLASS 144**

34R 3,818,957
326R 3,818,960
3,818,961

**CLASS 148**

1.6 3,819,421
6.15R 3,819,423
3,819,424
6.15Z 3,819,422
6.16 3,819,425
120 3,819,426
122 3,819,427
125 3,819,428

**CLASS 149**

21 3,819,429

**CLASS 150**

1 3,818,962
15 3,818,963

**CLASS 152**

209R 3,818,964
3,818,965
210 3,818,966

**CLASS 156**

3 3,819,430
7 3,819,431
11 3,819,432
13 3,819,433
54 3,819,434
62.2 3,819,435
63 3,819,436
73 3,819,437
79 3,819,438
85 3,819,401
89 3,819,439
94 3,819,440
167 3,819,441
180 3,819,442
204 3,819,443
250 3,819,444
277 3,819,445
291 3,819,446
330 3,819,447
355 3,819,448
413 3,819,449
425 3,819,450
433 3,819,451
441 3,819,452
459 3,819,453
505 3,819,454

**CLASS 157**

1.22 3,818,967
1.24 3,818,968

**CLASS 160**

168 3,818,969
349 3,818,970

**CLASS 161**

7 3,819,455
3,819,456
14 3,819,457
15 3,819,458
23 3,819,459
42 3,819,460
58 3,819,461
62 3,819,462
64 3,819,463
3,819,464
74 3,819,465
89 3,819,466
113 3,819,467
152 3,819,468
154 3,819,469
162 3,819,471
185 3,819,472
214 3,819,473

**CLASS 162**

157C 3,819,470
313 3,819,474
354 3,819,475

**CLASS 164**

4 3,818,971
87 3,818,972
252 3,818,973
255 3,818,974
300 3,818,985

**CLASS 165**

1 3,818,975
3,818,976
2 3,818,977
9 3,818,978
21 3,818,979
32 3,818,980
35 3,818,981
86 3,818,982
105 3,818,983
166 3,818,984

**CLASS 166**

51 3,818,986
134 3,818,987
140 3,818,988
274 3,818,989
280 3,818,990
283 3,818,991
305R 3,818,992
308 3,818,993

**CLASS 169**

37 3,818,994

**CLASS 172**

212 3,818,995

**CLASS 174**

11R 3,819,845
3,819,846
37 3,819,847
72A 3,819,848
86 3,819,849
94R 3,819,850
211 3,819,851

**CLASS 175**

57 3,818,996
3,818,997
72 3,818,998
325 3,818,999

**CLASS 176**

37 3,819,476
76 3,819,477
87 3,819,478
3,819,479

**CLASS 178**

5.6 3,819,852
6.7R 3,819,854
7.81 3,819,855
3,819,856
19 3,819,857
68 3,819,853
69.5TV 3,819,859
69.5R 3,819,858

**CLASS 179**

1M 3,819,861
1P 3,819,860
2DP 3,819,863
2A 3,819,862
15AT 3,819,865
15BL 3,819,864
16AA 3,819,866
18FC 3,819,869
18GF 3,819,867
18C 3,819,868
26 3,819,870
27F 3,819,871
41A 3,819,872
84L 3,819,873
100.3A 3,819,874
107FD 3,819,875
115.5VC 3,819,876
170R 3,819,877
175.3R 3,819,878
179 3,819,879

**CLASS 180**

5R 3,819,000
19H 3,819,001
32 3,819,002
79.2R 3,819,003
82R 3,819,004

**CLASS 181**

33GD 3,819,010
33D 3,819,008
33G 3,819,007
3,819,009
145 3,819,006
153 3,819,005

**CLASS 182**

48 3,819,011

**CLASS 186**

1A 3,819,012

**CLASS 187**

11 3,819,013

**CLASS 188**

1B 3,819,014
62 3,819,017
73.3 3,819,015
82.6 3,819,016

**CLASS 191**

12R 3,819,880
66 3,819,881

**CLASS 192**

8R 3,819,018
41A 3,819,019
103FA 3,819,020
111A 3,819,021
134 3,819,022

**CLASS 193**

40 3,819,023

**CLASS 195**

1.8 3,819,480
28N 3,819,481
3,819,482
29 3,819,483
31R 3,819,484
80R 3,819,485
3,819,486
99 3,819,487
103.5R 3,819,488
127 3,819,489
3,819,490

**CLASS 197**

1R 3,819,024
3,819,025
82 3,819,028
171 3,819,026
175 3,819,027
189 3,819,029

**CLASS 198**

165 3,819,030
172 3,819,031
180 3,819,032

**CLASS 200**

1R 3,819,882
11J 3,819,883
27A 3,819,884
35R 3,819,885
38B 3,819,886
44 3,819,887
47 3,819,888
48R 3,819,889
61.08 3,819,890
67D 3,819,891
144B 3,819,892
146R 3,819,893
156 3,819,894
159B 3,819,895
166J 3,819,896
263 3,819,897

**CLASS 203**

29 3,819,491
34 3,819,492
70 3,819,493

**CLASS 204**

15 3,819,497
146 3,819,494
159.14 3,819,498
159.19 3,819,495
3,819,496
195S 3,819,499
3,819,500
198 3,819,501
206 3,819,502
268 3,819,503
289 3,819,504
299 3,819,505

**CLASS 206**

5 3,819,033
45.14 3,819,034
3,819,035
216 3,819,036
222 3,819,037
223 3,819,038
315 3,819,040
388 3,819,039
390 3,819,041
443 3,819,042
449 3,819,043
507 3,819,044

**CLASS 208**

8 3,819,506
139 3,819,507
180 3,819,508
216 3,819,509
290 3,819,510
353 3,819,511

**CLASS 209**

17 3,819,045
74M 3,819,046
80 3,819,047
166 3,819,048
250 3,819,049
254 3,819,050

**CLASS 210**

8 3,819,512
23 3,819,513
40 3,819,514
42 3,819,515
50 3,819,051
63 3,819,516
90 3,819,052
108 3,819,053
195 3,819,054
232 3,819,055
321 3,819,056

**CLASS 211**

50 3,819,057
60T 3,819,058

**CLASS 212**

35R 3,819,059

**CLASS 213**

43 3,819,060

**CLASS 214**

1BB 3,819,061
1C 3,819,064
1Q 3,819,062
3 3,819,063
14 3,819,065
16B 3,819,066
26 3,819,067
38C 3,819,068
41 3,819,069
49 3,819,070
83.3 3,819,071
83.36 3,819,072
338 3,819,073
450 3,819,074
505 3,819,075
512 3,819,076
516 3,819,077
730 3,819,078

**CLASS 219**

8.5 3,819,898
10.55 3,819,899
3,819,900
76 3,819,901
125PL 3,819,902
464 3,819,903
492 3,819,904
501 3,819,905
506 3,819,906

**CLASS 220**

5A 3,819,079
17 3,819,080
3,819,081
24R 3,819,082
54 3,819,083
64 3,819,084
75 3,819,085

**CLASS 221**

11 3,819,086
123 3,819,087
224 3,819,088

**CLASS 222**

95 3,819,089
182 3,819,090
327 3,819,091
389 3,819,092
529 3,819,093

**CLASS 224**

1R 3,819,094
5C 3,819,095

**CLASS 225**

96.5 3,819,096

**CLASS 226**

39 3,819,097
85 3,819,098
91 3,819,099

**CLASS 227**

19 3,819,100
130 3,819,101

**CLASS 228**

1 3,819,102
3 3,819,103
3,819,104

**CLASS 229**

39R 3,819,105
62 3,819,106
62.5 3,819,107

**CLASS 231**

2E 3,819,108

**CLASS 232**

24 3,819,109

**CLASS 233**

17 3,819,110
27 3,819,111

**CLASS 235**

1B 3,819,907
61A 3,819,112
61.11E 3,819,908
3,819,910
3,819,911
3,819,912
61.11R 3,819,909
92PC 3,819,913
150.22 3,819,914
151 3,819,915
151.11 3,819,916
151.12 3,819,917
151.3 3,819,918
151.34 3,819,919
152 3,819,920
156 3,819,921
193 3,819,922

**CLASS 236**

1C 3,819,113

**CLASS 238**

121 3,819,114

**CLASS 239**

15 3,819,115
102 3,819,116
265.23 3,819,117
276 3,819,118
337 3,819,119
661 3,819,120

**CLASS 240**

1R 3,819,923
2SL 3,819,924
2S 3,819,928
2.25 3,819,925
7.1R 3,819,926
8.22 3,819,927
41.37 3,819,929
54R 3,819,930
103R 3,819,931

**CLASS 241**

240 3,819,121

**CLASS 242**

18PW 3,819,123
18R 3,819,122
71.8 3,819,124
77.1 3,819,125
107.4 3,819,126
156.2 3,819,127
189 3,819,128
192 3,819,129
199 3,819,130
3,819,131

**CLASS 244**

3.28 3,819,132
42CC 3,819,134
42DA 3,819,133
77D 3,819,135
116 3,818,958

**CLASS 246**

1R 3,819,932
114 3,819,933
130 3,819,934
435 3,819,935

**CLASS 248**

42 3,819,136
49 3,819,137
73 3,819,139
110 3,819,140
146 3,819,138
223 3,819,141
397 3,819,142

**CLASS 249**

33 3,819,143
205 3,819,145

**CLASS 250**

83.3R 3,819,936
222R 3,819,938
225 3,819,939
227 3,819,940
281 3,819,941
324 3,819,942
341 3,819,943
353 3,819,944
373 3,819,945
374 3,819,946
505 3,819,937
559 3,819,947
3,819,948

**CLASS 251**

11 3,819,146
14 3,819,147
252 3,819,148
309 3,819,149
315 3,819,150
342 3,819,151
367 3,819,152

**CLASS 252**

8.1 3,819,517
3,819,518
8.5C 3,819,519
8.55C 3,819,520
18 3,819,521
89 3,819,522
3,819,523
90 3,819,524
132 3,819,525
135 3,819,526

149 3,819,527
153 3,819,528
156 3,819,529
311.5 3,819,530
408 3,819,531
447 3,819,532
455R 3,819,533
457 3,819,534
462 3,819,535
3,819,536
476 3,819,537
527 3,819,538
547 3,819,539
555 3,819,540

**CLASS 254**

93R 3,819,153
134.3PA 3,819,154
173R 3,819,156
175.5 3,819,155

**CLASS 259**

4 3,819,157
72 3,819,158

**CLASS 260**

2BP 3,819,541
2.5FP 3,819,547
3,819,550
2.5HA 3,819,543
2.5B 3,819,544
3,819,546
2.5M 3,819,542
2.5R 3,819,545
18R 3,819,548
18S 3,819,549
23EP 3,819,551
27BB 3,819,552
28 3,819,553
28.5D 3,819,554
29.4UA 3,819,555
29.6PS 3,819,556
29.6TA 3,819,557
29.6WB 3,819,559
31.8M 3,819,560
32.6A 3,819,561
33.4R 3,819,562
37EP 3,819,564
37SB 3,819,563
42.13 3,819,565
42.14 3,819,566
42.28 3,819,567
42.52 3,819,568
45.75C 3,819,577
45.75K 3,819,576
45.75N 3,819,569
45.75R 3,819,575
45.8SN 3,819,574
45.8N 3,819,572
45.8R 3,819,571
45.9R 3,819,573
47EN 3,819,581
47ET 3,819,579
47P 3,819,580
63R 3,819,582
3,819,583
75M 3,819,584
3,819,585
77.5TB 3,819,586
78A 3,819,588
78R 3,819,587
78.5T 3,819,589
80.7 3,819,590
80.78 3,819,591
3,819,592
86.1E 3,819,593
87.5A 3,819,594
87.7 3,819,595
91.1M 3,819,596
93.5W 3,819,597
94.9DA 3,819,599
94.9D 3,819,598
112R 3,819,605
112.5 3,819,606
3,819,607
117 3,819,608
141 3,819,609
210AB 3,819,611
211.5R 3,819,612
3,819,613
239BB 3,819,614
239.1 3,819,600
3,819,601
239.3D 3,819,602
239.55R 3,819,604
239.6 3,819,603
240C 3,819,615
240F 3,819,618
240G 3,819,616
240K 3,819,617
243C 3,819,619
3,819,620
3,819,621
3,819,622
3,819,623
247.2A 3,819,624
247.5R 3,819,625
249.8 3,819,626

251QB 3,819,627
256.4F 3,819,631
256.4N 3,819,629
256.4Q 3,819,628
256.5R 3,819,630
282 3,819,632
283SA 3,819,633
283S 3,819,634
285 3,819,635
3,819,636
288R 3,819,637
294.8C 3,819,640
294.8F 3,819,639
296D 3,819,558
296R 3,819,641
302H 3,819,642
306.7 3,819,643
307D 3,819,644
308B 3,819,645
309 3,819,646
309.6 3,819,647
326R 3,819,648
327M 3,819,649
329.3 3,819,650
332.8 3,819,651
3,819,652
333 3,819,653
335 3,819,654
340.3 3,819,655
343.7 3,819,656
345.5 3,819,657
346.3 3,819,658
346.4 3,819,659
346.8R 3,819,660
347.3 3,819,661
348R 3,819,662
348.5L 3,819,663
356 3,819,664
376 3,819,665
402.5 3,819,666
405 3,819,667
408 3,819,668
410.9R 3,819,669
440 3,819,670
448AD 3,819,671
448.2E 3,819,673
3,819,674
448.2N 3,819,672
448.8R 3,819,675
453R 3,819,570
456R 3,819,676
464 3,819,677
465D 3,819,678
465.3 3,819,679
465.8R 3,819,578
471C 3,819,681
471R 3,819,680
479C 3,819,682
3,819,683
3,819,684
486R 3,819,685
488B 3,819,686
3,819,687
502R 3,819,688
503 3,819,689
507R Re.28,055
510 3,819,690
513R 3,819,691
519 3,819,692
520 3,819,693
521R 3,819,694
524R 3,819,695
535P 3,819,696
553A 3,819,697
558H 3,819,698
561A 3,819,699
561S 3,819,700
564RF 3,819,701
564G 3,819,702
564R 3,819,703
566R 3,819,704
567.6M 3,819,705
570.5C 3,819,706
570.5P 3,819,707
573 3,819,708
577 3,819,709
584R 3,819,710
586R 3,819,711
593R 3,819,712
3,819,713
595 3,819,714
601R 3,819,715
607A 3,819,716
608 3,819,717
609B 3,819,718
613D 3,819,719
615A 3,819,720
617F 3,819,721
618D 3,819,722
618R 3,819,723
625 3,819,725
3,819,726
632CB 3,819,724
638HF 3,819,727
643B 3,819,728
653.3 3,819,729

654R 3,819,730
3,819,731
659A 3,819,732
665G 3,819,733
666A 3,819,734
671P 3,819,735
672T 3,819,736
675.5 3,819,737
677A 3,819,738
3,819,739
679R 3,819,740
680E 3,819,741
681.5R 3,819,742
683.47 3,819,743
824R 3,819,744
825 3,819,745
830TW 3,819,746
3,819,747
850 3,819,757
857L 3,819,758
860 3,819,759
861 3,819,760
874 3,819,761
876R 3,819,762
3,819,763
877 3,819,764
878R 3,819,765
879 3,819,766
880B 3,819,767
897A 3,819,769
897B 3,819,768
898 3,819,770
921 3,819,771
927R 3,819,748
928 3,819,749
929 3,819,750
938 3,819,751
941 3,819,752
942 3,819,753
954 3,819,754
955 3,819,755
956 3,819,756

**CLASS 261**

44R 3,819,159
123 3,819,160

**CLASS 264**

22 3,819,772
37 3,819,773
40 3,819,774
3,819,775
3,819,776
3,819,777
3,819,778
45 3,819,779
3,819,780
46 3,819,781
49 3,819,782
52 3,819,783
54 3,819,784
63 3,819,785
3,819,786
65 3,819,787
89 3,819,788
3,819,790
94 3,819,789
3,819,791
95 3,819,792
202 3,819,610
213 3,819,793
228 3,817,794
248 3,819,795
292 3,819,638
321 3,819,796

**CLASS 266**

13 3,819,161
23NN 3,819,163
23M 3,819,162
29 3,819,164
41 3,819,165

**CLASS 267**

64R 3,819,166
139 3,819,167
141 3,819,168
155 3,819,169

**CLASS 269**

3 3,819,170
228 3,819,171

**CLASS 270**

41 3,819,172
54 3,819,173

**CLASS 271**

154 3,819,174
174 3,819,175

**CLASS 272**

63 3,819,176
82 3,819,177

**CLASS 273**

1E 3,819,178
26B 3,819,179
80C 3,819,180
80.2 3,819,181
95R 3,819,182
98 3,819,183

131BA 3,819,184
134CG 3,819,185
138A 3,819,186
156 3,819,187
160 3,819,188
183B 3,819,189
232 3,819,190

**CLASS 277**

22 3,819,191
212C 3,819,192

**CLASS 279**

2R 3,819,193
23 3,819,194
46 3,819,195

**CLASS 280**

11.13K 3,819,198
11.35C 3,819,200
11.35M 3,819,199
11.35T 3,819,201
96.2B 3,819,202
150AB 3,819,203
3,819,204
3,819,205
150SB 3,819,196
3,819,197
487 3,819,206

**CLASS 285**

45 3,819,207
47 3,819,208
73 3,819,209
114 3,819,210
336 3,819,211
356 3,819,212

**CLASS 290**

38 Re.28,052

**CLASS 292**

21 3,819,213
169.13 3,819,214
201 3,819,215
259 3,819,216
345 3,819,217

**CLASS 293**

70 3,819,218
88 3,819,219

**CLASS 294**

19R 3,819,220
3,819,221

**CLASS 296**

1S 3,819,222
26 3,819,223
28R 3,819,224
35R 3,819,225
90 3,819,226
137D 3,819,227
146 3,819,228

**CLASS 297**

84 3,819,229
250 3,819,230
458 3,819,232

**CLASS 299**

4 3,819,231
37 3,819,144

**CLASS 303**

1 3,819,233
20 3,819,234
21BE 3,819,237
21F 3,819,235
3,819,236
47 3,819,238

**CLASS 305**

35R 3,819,239
54 3,819,240

**CLASS 307**

10R 3,819,949
149 3,819,950
202 3,819,951
3,819,952
221D 3,819,953
3,819,954
225 3,819,955
254 3,819,956
264 3,819,957
304 3,819,958
3,819,959
310 3,819,960

**CLASS 308**

3R 3,819,241
36.1 3,819,242
191 3,819,243

**CLASS 310**

8.1 3,819,961
8.3 3,819,962
8.7 3,819,963
46 3,819,964
58 3,819,965
74 3,819,966
236 3,819,967

**CLASS 312**

101 3,819,244
253 3,819,245
257SK 3,819,246

330 3,819,247

**CLASS 313**

60 3,819,968
105 3,819,969
225 3,819,970
330 3,819,971
480 3,819,972
498 3,819,973
499 3,819,974
517 3,819,975

**CLASS 315**

3.5 3,819,976
5.43 3,819,977
26 3,819,978
27GD 3,819,984
29 3,819,979
86 3,819,980
3,819,981
94 3,819,982
238 3,819,983

**CLASS 317**

2F 3,818,545
3 3,819,985
16 3,819,986
70 3,819,987
99 3,819,988
101F 3,819,989
258 3,819,990

**CLASS 318**

39 3,819,991
171 3,819,992
203 3,819,993
221E 3,819,994
3,819,995
224 3,819,996
258 3,819,997
277 3,819,998
609 3,819,999

**CLASS 320**

2 3,820,000

**CLASS 321**

3,820,001
5 3,820,002
3,820,003
15 3,820,004
18 3,820,005
45R 3,820,006

**CLASS 322**

28 3,820,009

**CLASS 323**

8 3,820,007
17 3,820,008

**CLASS 324**

.5R 3,820,010
I4 3,820,012
16R 3,820,013
30R 3,820,014
33 3,820,015
37 3,820,016
51 3,820,017
52 3,820,018
54 3,820,011
71CP 3,820,019
3,820,020
78Q 3,820,021
83D 3,820,022
133 3,820,023
165 3,820,024
182 3,820,025

**CLASS 325**

364 3,820,026
470 3,820,027

**CLASS 328**

I4 3,820,028
58 3,820,029
63 3,820,030
71 3,820,051
119 3,820,031
133 3,820,032
151 3,820,033
164 3,820,034
233 3,820,035

**CLASS 330**

28 3,820,036

**CLASS 331**

94.5C 3,820,037
94.5Q 3,820,038
99 3,820,039
156 3,820,040

**CLASS 333**

1.1 3,820,041
18 3,820,042
30R 3,820,043
70S 3,820,045
81A 3,820,044

**CLASS 335**

13 3,820,046
229 3,820,047

**CLASS 336**

70 3,820,048

**CLASS 337**

319 3,820,049
408 3,820,050

**CLASS 338**

97 3,820,052

**CLASS 339**

17CF 3,820,054
17F 3,820,053
3,820,055
22B 3,820,057
22R 3,820,056
99R 3,820,058
100 3,820,059
220L 3,820,060
252 3,820,061

**CLASS 340**

3R 3,820,062
18LD 3,820,063
25 3,820,064
51 3,820,065
65 3,820,066
146.3AG 3,820,068
146.3B 3,820,067
146.3H 3,820,069
147R 3,820,070
149A 3,820,071
3,820,072
151 3,820,073
3,820,074
172.5 3,820,075
3,820,076
3,820,077
3,820,078
3,820,079
3,820,080
3,820,081
3,820,082
3,820,083
3,820,084
3,820,085
173FF 3,820,086
173LM 3,820,087
173.2 3,820,088
174EB 3,820,089
3,820,092
174TF 3,820,091
3,820,093
174ZB 3,820,090
199 3,820,094
200 3,820,095
204 3,820,096
228.2 3,820,097
244B 3,820,098
248A 3,820,099
258C 3,820,100
259 3,820,101
276 3,820,102
280 3,820,103
3,820,104
309.4 3,820,105
310A 3,820,106
324R 3,820,107
336 3,820,108
347AD 3,820,111
3,820,112
347NT 3,820,109
347P 3,820,110

**CLASS 343**

7.3 3,820,113
3,820,119
17.7 3,820,114
107 3,820,115
756 3,820,116
802 3,820,117
872 3,820,118

**CLASS 346**

139B 3,820,120
140 3,820,121

**CLASS 350**

3.5 3,819,248
96WG 3,819,249
96R 3,819,250
121 3,819,251
160R 3,819,252
220 3,819,253
255 3,819,254
286 3,819,255

**CLASS 351**

6 3,819,256

**CLASS 352**

72 3,819,257
163 3,819,258

**CLASS 354**

7 3,820,123
12 3,820,127
15 3,820,122
23 3,820,124
24 3,820,126
25 3,820,129
32 3,820,128
34 3,820,130
38 3,820,131

| | |
|---|---|
| 51 | 3,820,125 |
| 53 | 3,820,132 |
| 60 | 3,820,133 |
| 81 | 3,820,134 |
| | 3,820,135 |
| | 3,820,136 |
| 86 | 3,820,137 |
| 142 | 3,820,138 |
| 152 | 3,820,139 |
| 171 | 3,820,140 |
| | 3,820,141 |
| 206 | 3,820,142 |
| | 3,820,143 |
| 234 | 3,820,144 |
| 250 | 3,820,145 |
| 288 | 3,820,146 |
| | 3,820,147 |
| 295 | 3,820,148 |
| 317 | 3,820,149 |
| **CLASS 355** | |
| 3 | 3,819,259 |
| | 3,819,260 |
| 14 | 3,819,261 |
| 15 | 3,819,262 |
| 17 | 3,819,263 |
| 43 | 3,819,264 |
| 51 | 3,819,265 |
| 64 | 3,819,266 |
| **CLASS 356** | |
| 21 | 3,819,267 |
| 28 | 3,819,268 |
| 36 | 3,819,269 |
| 39 | 3,819,270 |
| | 3,819,271 |
| 138 | 3,819,272 |
| 152 | 3,819,273 |
| 170 | 3,819,274 |
| 175 | 3,819,275 |
| 184 | 3,819,276 |
| 204 | 3,819,277 |
| 208 | 3,819,278 |
| 244 | 3,819,279 |
| 249 | 3,819,280 |
| **CLASS 357** | |
| 2 | 3,820,150 |
| 13 | 3,820,151 |
| 74 | 3,820,152 |
| 81 | 3,820,153 |
| **CLASS 358** | |
| 8 | 3,820,154 |
| 10 | 3,820,155 |
| | 3,820,156 |
| 30 | 3,820,157 |
| **CLASS 360** | |
| 51 | 3,819,281 |
| 96 | 3,820,158 |
| 106 | 3,820,159 |
| | 3,820,160 |
| **CLASS 401** | |
| 105 | 3,819,282 |
| 106 | 3,819,283 |
| 151 | 3,819,284 |
| 190 | 3,819,285 |
| **CLASS 403** | |
| 31 | 3,819,286 |
| 211 | 3,819,287 |
| 247 | 3,819,288 |
| 259 | 3,819,289 |
| 388 | 3,819,290 |
| **CLASS 404** | |
| 75 | 3,819,291 |
| **CLASS 415** | |
| 150 | 3,819,292 |
| 200 | 3,819,293 |
| **CLASS 416** | |
| 93 | 3,819,294 |
| 97 | 3,819,295 |
| 157 | 3,819,296 |
| **CLASS 417** | |
| 38 | 3,819,297 |
| 44 | 3,819,298 |
| 52 | 3,819,299 |
| 191 | 3,819,300 |
| 209 | 3,819,301 |
| 234 | 3,819,302 |
| 305 | 3,819,303 |
| 375 | 3,819,304 |
| 413 | 3,819,305 |
| 566 | 3,819,306 |
| **CLASS 418** | |
| 61B | 3,819,307 |
| 181 | 3,819,308 |
| 219 | 3,819,309 |
| **CLASS 423** | |
| 27 | 3,819,797 |
| 41 | 3,819,798 |
| 53 | 3,819,799 |
| 58 | 3,819,800 |
| 130 | 3,819,337 |
| 138 | 3,819,801 |
| 158 | 3,819,802 |
| 160 | 3,819,803 |
| 206 | 3,819,805 |
| 220 | 3,819,806 |
| 261 | 3,819,804 |
| 265 | 3,819,807 |
| 286 | 3,819,808 |
| 300 | 3,819,809 |
| 321 | 3,819,810 |
| 338 | 3,819,811 |
| 358 | 3,819,812 |
| 421 | 3,819,813 |
| 446 | 3,819,814 |
| 498 | 3,819,815 |
| 522 | 3,819,816 |
| 563 | 3,819,817 |
| 588 | 3,819,818 |
| 645 | 3,819,819 |
| **CLASS 424** | |
| 1 | 3,819,820 |
| 5 | 3,819,821 |
| 8 | 3,819,822 |
| 40 | 3,819,823 |
| 44 | 3,819,824 |
| 47 | 3,819,825 |
| 49 | 3,819,826 |
| 70 | 3,819,827 |
| 71 | 3,819,828 |
| 93 | 3,819,829 |
| 94 | 3,819,830 |
| 98 | 3,819,831 |
| 115 | 3,819,832 |
| 117 | 3,819,833 |
| 120 | 3,819,834 |
| 122 | 3,819,835 |
| 124 | 3,819,836 |
| **CLASS 425** | |
| 6 | 3,819,310 |
| 78 | 3,819,311 |
| 242R | 3,819,312 |
| 244 | 3,819,313 |
| 249 | 3,819,314 |
| 383 | 3,819,315 |
| 387B | 3,819,317 |
| 470 | 3,819,316 |
| **CLASS 426** | |
| 27 | 3,819,837 |
| 89 | 3,819,838 |
| 93 | 3,819,839 |
| **CLASS 431** | |
| 1 | 3,819,318 |
| 5 | 3,819,319 |
| 254 | 3,819,320 |
| 350 | 3,819,321 |
| **CLASS 432** | |
| 5 | 3,819,322 |
| 138 | 3,819,323 |
| **CLASS 444** | |
| 1 | 3,820,161 |

## CLASSIFICATION OF DESIGNS

| | | |
|---|---|---|
| D03— | 19A | 231,871 |
| D04— | 25 | 231,872 |
| D06— | 4 | 231,873 |
| | 14 | 231,874 |
| | 17 | 231,875 |
| | 26 | 231,880 |
| | 28 | 231,876 |
| | 29 | 231,877 |
| | 39 | 231,878 |
| | 68 | 231,879 |
| | 79 | 231,881 |
| | 96 | 231,882 |
| | 130 | 231,883 |
| | 164 | 231,884 |
| | 175 | 231,885 |
| | | 231,886 |
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46 : 3,819,094

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57 : 3,818,612

## DESIGN PATENTS

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9 : 231,872
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11 : 231,876
12 : 231,935
16 : 231,912
17 : 231,896
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22 : 231,882
25 : 231,948
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28 : 231,878
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36 : 231,879
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37 : 231,884
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53 : 231,908
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55 : 231,889
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## PLANT PATENTS

6 : 3,577

3,579

3,580

39 : 3,576

53 : 3,578

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C. Marshall Dann, *Commissioner*